

**Final**  
**Site-Specific Field Sampling Plan and**  
**Site-Specific Safety and Health Plan Attachments**  
**Golf Course, Parcel 178(7)**  
**Former Printing Plant, Building 1060, Parcel 172(7)**  
**Bulk Storage Area, Building 296, Parcel 60(6)**

**Fort McClellan**  
**Calhoun County, Alabama**

**Delivery Order CK005**  
**Contract No. DACA21-96-D-0018**  
**IT Project No. 774645**

**December 1998**

**Revision 1**

## ***Site-Specific Field Sampling Plans***

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Golf Course, Parcel 178(7)

Former Printing Plant, Building 1060, Parcel 172(7)

Bulk Storage Area, Building 296, Parcel 60(6)

**Site Investigation**  
**Final**  
**Site-Specific Field Sampling Plan Attachment**  
**for the Golf Course, Parcel 178(7)**

**Fort McClellan**  
**Calhoun County, Alabama**

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## **List of Acronyms**

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ADEM	Alabama Department of Environmental Management
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Program
COC	chain of custody
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
PID	photoionization detector
PSSC	potential site-specific chemicals
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
USACE	U.S. Army Corps of Engineers
WP	installation-wide work plan

## ***Executive Summary***

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In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct site investigation activities at the Golf Course, Parcel 178(7) to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the Golf Course, Parcel 178(7), Fort McClellan (FTMC), Calhoun County, Alabama. The pesticide mixing facility, Building S-2252 where pesticides are stored and mixed prior to applying them to the Golf Course, is another parcel and will not be addressed in this site investigation (SI).

Potential contaminant sources at the Golf Course site include fertilizers, pesticides and herbicides used to maintain the fairways, greens and lawns at the Golf Course. IT will collect 12 surface soil samples, 5 surface water samples, and 5 sediment samples at this site. Chemical analyses of the samples collected during the field program will include metals, chlorinated pesticides, chlorinated herbicides, organophosphorus pesticides, and anions. Results from these analyses will be compared with site-specific screening levels specified in the installation wide work plan and regulatory agency guidelines.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for the Golf Course, Parcel 178(7), will be used in conjunction with the site-specific safety and health plan (SSHP), and the installation-wide work plan (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

The Community Environmental Response Facilitation Act (CERFA) guidelines state that routine pesticide/herbicide use, applied in accordance with manufacturers directions, is exempt from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements and, therefore, should not disqualify a parcel that is otherwise uncontaminated (Environmental Science and Engineering, Inc. [ESE], 1998). Review of the EBS indicates there have been problems with the handling of pesticides and herbicides at FTMC. Also, there has been three recorded pesticide releases or spills since 1977 at FTMC, however, none of these occurred at the Golf Course (ESE, 1998). There is not any recorded information that inappropriate handling of pesticides or herbicides has occurred on the Golf Course, Parcel 178, site. The mixing and storage of pesticides and herbicides for the Golf Course is performed at the Golf Course Pesticide Mixing and Storage Facility, Building S-2252. The Golf Course Pesticide



Mixing and Storage Facility, Building S-2252, is categorized as a separate parcel, Parcel 83(7) and is not addressed under the Golf Course investigation in this SI.

The Base Realignment and Closure Cleanup Team (BRAC Cleanup Team) believes that there is the potential for non-certified applicators to have applied pesticides in an inappropriate manner at the Golf Course, and the potential that these occurrences may not be adequately reflected in records retained at FTMC. The BRAC Cleanup Team has determined that the Golf Course requires additional investigation before release to the public; therefore, the Golf Course is classified Category 7; areas that have not been evaluated or require further evaluation.

## ***1.0 Project Description***

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### ***1.1 Introduction***

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Golf Course, Parcel 178(7), under Delivery Order CK005, Contract No. DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the Golf Course, Parcel 178(7) site. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Golf Course, Parcel 178(7) site, and the installation-wide work plan (WP) (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP).

### ***1.2 Site Description***

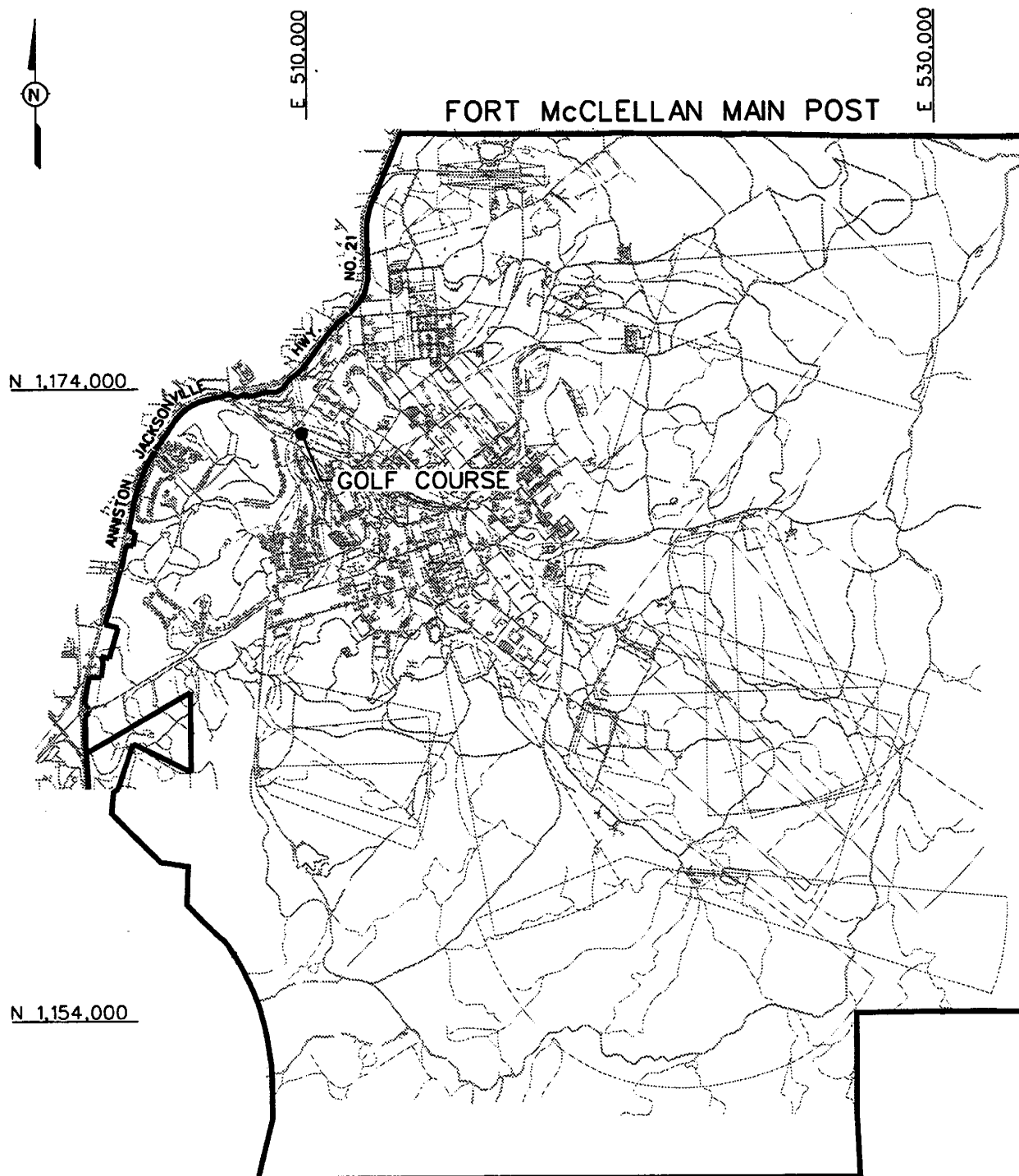
The Golf Course, Parcel 178(7) is located in the central area of the FTMC Main Post and covers 46 acres (Figure 1-1). Evidence of inappropriate application of pesticides, spills, or other releases at the Golf Course were not identified during the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Review of the EBS indicates there have been problems with the handling of pesticides and herbicides at FTMC. Also, there has been three recorded pesticide releases or spills since 1977 at FTMC, however, none of these occurred at the Golf Course (ESE, 1998). There is not any recorded information that inappropriate handling of pesticides or herbicides has occurred on the Golf Course, Parcel 178, site. The mixing and storage of pesticides and herbicides for the Golf Course is performed at the Golf Course Pesticide Mixing and Storage Facility, Building S-2252. The Golf Course Pesticide Mixing and Storage Facility, Building S-2252, is categorized as a separate parcel, Parcel 83(7) and is not addressed under the Golf Course investigation in this SI.

A variety of insecticides and herbicides have been applied at FTMC over the years. Personnel who applied pesticides were employed at the Golf Course, Roads and Grounds department, and at Pest Management (ESE, 1998). All personnel who applied pesticides at FTMC, whether employees of the government or private contractors, were licensed and certified (ESE, 1998).

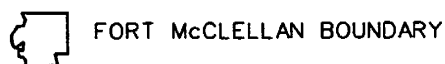
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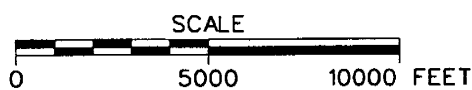
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FORT McCLELLAN BOUNDARY

**FIGURE 1-1**  
**SITE LOCATION MAP**  
**GOLF COURSE**  
**PARCEL 178(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



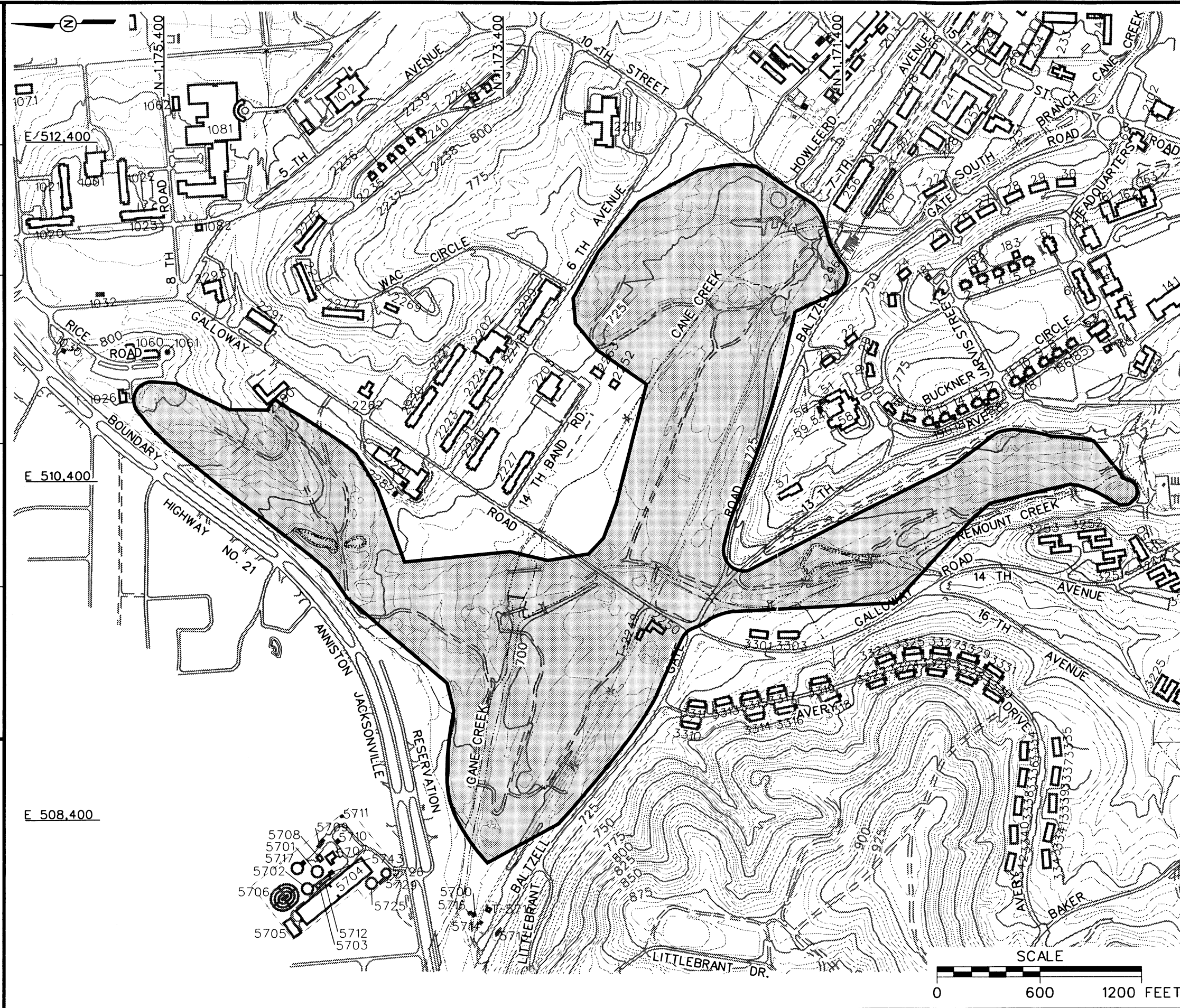
INTERNATIONAL  
TECHNOLOGY  
CORPORATION

This requirement for certification of all pesticide applicators went back at least as far as the 1970s and recertification was required every two years (ESE, 1998). However, personnel at the Golf Course and the Forestry Department were found to be out of certification compliance with these on at least one occasion (ESE, 1998). All pesticide applicators obtained Department of Defense certification after completing training at Fort Sam Houston, or they obtained certification from outside agencies. Pest Management staff obtained additional certification by the State of Alabama beginning in 1983 (ESE, 1998).

The Installation Spill Contingency Plan (ISCP) is followed for pesticide spills and leaks. As part of the ISCP, spills and leaks are to be reported to FTMC's Directorate of Environment and, if necessary, the Fire Department's spill response team (ESE, 1998). Since March 1977, only three releases of pesticides, either confirmed or unconfirmed, in violation of manufacturer specifications, were reported. There were not any incidences recorded at the Golf Course. The first was an accidental release of Dursban into Cane Creek from a wash rack at the Department of Engineering and Housing Motor Pool, Building 214. The release originated from an oil/water separator into which a pesticide tank had been erroneously washed. Complete breakdown of the Dursban was believed to have occurred within 1 week of the release. The second release (potential) occurred when Building. 598. The third release of pesticide was the burial of approximately 1 pound of Diaznon dust in the Landfill No. 4.

The Community Environmental Response Facilitation Act (CERFA) guidelines state that routine pesticide/herbicide use, applied in accordance with manufacturers directions, is exempt from Comprehensive Environmental Response, Compensation, and Liability Act and, therefore, should not disqualify a parcel that is otherwise uncontaminated. However, the Base Realignment and Closure (BRAC) Cleanup Team believes that there is the potential for non-certified applicators to have applied pesticides in an inappropriate manner at the Golf Course, and the potential that these occurrences may not be adequately reflected in records retained at FTMC. The BRAC Cleanup Team has determined that the Golf Course requires additional investigation before release to the public; therefore, the Golf Course is classified Category 7; areas that have not been evaluated or require further evaluation.

The site elevation at this site ranges from approximately 800 feet at the northern end of the course to approximately 700 feet at the western end of the site along Cane Creek. Cane Creek, which is a perennial stream, flows to the northwest and transects the Golf Course from the southeast to the northwest (Figure 1-2). The confluence of Remount Creek and Cane Creek is located in the western section of the site and northwest of the Golf Course club house. Several other



### LEGEND






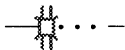
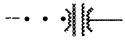

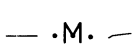

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|-------------------------------------------------------------------------------------|-------------------------------------|
|  | UNIMPROVED ROADS AND PARKING        |
|  | PAVED ROADS AND PARKING             |
|  | BUILDING                            |
|  | TOPOGRAPHIC CONTOURS                |
|  | PARCEL BOUNDARY                     |
|  | BRIDGE                              |
|  | CULVERT WITH HEADWALL               |
|  | SURFACE DRAINAGE / CREEK            |
|  | MANMADE SURFACE DRAINAGE<br>FEATURE |
|  | FENCE                               |

FIGURE 1-2  
SITE MAP  
GOLF COURSE  
PARCEL 178(7)

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



small intermittent tributaries feed Cane Creek in the central portion of the Golf Course. Shallow groundwater direction is probably controlled by the topography and Cane Creek. Groundwater would likely flow to the south to Cane Creek for the northern section of the Golf Course. Groundwater flow in the southern section of the site would likely flow in a northerly direction along Remount Creek toward Baltzell Gate Road and Cane Creek. (Figure 1-2).

There are several soil types and mapping units at the Golf Course (U.S. Department of Agriculture, 1961). The following are the mapping units that describe the soils at the Golf Course site:

- Montevallo shaly silty clay loam, 10 to 40 percent slopes, severely eroded (MtD3) - highest elevation in the north end of the site.
- Montevallo shaly silty clay loam, 6 to 10 percent slopes, severely eroded (MtC3) - next to highest elevations in both the northern and southern sections of the site.
- Philo and Stendal soils, local alluvium, 0 to 2 percent slopes (PkA) - along Remount Creek in southern section of the site, south of Baltzell Gate Road.
- Philo and Stendal fine sandy loams, 0 to 2 percent slopes (PhA) – along Cane Creek throughout the site.
- Anniston and Allen gravelly loams, 15 percent slopes, eroded (AcE2) – along southwestern edge of site between railroad tracks and Baltzell Gate Road in the western end of the site.

These mapping units are subunits of the following soil series:

- Montevallo series
- Philo series
- Stendal series
- Anniston series
- Allen series.

The Montevallo series consists of shallow, well drained strongly acid soils that have developed in the residuum of interbedded shale and fine grained sandstone or limestone. Where these soils are not eroded, the surface soil is very dark grayish-brown to very dark brown shaly silt loam. Fragments of shale, less than 2 inches in size, are commonly in the soil. The depth to bedrock typically ranges from 1 foot to 1.5 feet below ground surface (bgs). The depth to the water table for this series is usually greater than 20 feet bgs.

The Philo series consists of strongly acid, moderately well-drained soils that are developing in local and general alluvium. The parent material washed mainly from sandstone and shale, but some of it originated from limestone. Philo soils occur on first bottoms along most streams in the northern part of Calhoun County. The surface soil is very dark grayish-brown to dark-brown fine sandy loam, and the subsoil is dark-brown, slightly mottled fine sandy loam.

The Stendal series consists of strongly acid, somewhat poorly drained soils that are developing in general alluvium that washed chiefly from sandstone and shale. Some of the material originated from limestone. These soils occur on first bottoms along most streams in the northern part of Calhoun County. The surface soil is a dark grayish-brown fine sandy loam and the subsurface soil is a dark-brown, mottled fine sandy loam.

For the Philo and Stendal series soils, the depth to bedrock typically is 6 feet bgs or greater. The depth to the water table for this series is usually 1 to 2 feet bgs.

The Anniston series of soils consists of strongly acid, deep, well-drained soils that have developed in old local alluvium. The parent material washed from the adjacent higher lying Linker, Muskingum, Enders, and Montevallo soils. The surface soils are primarily dark-brown loam, and the subsoil is primarily dark-red sandy clay loam. These sites contain sandstone and quartzite gravel and cobbles, which measure as much as 8 inches in diameter on the surface and throughout the soil.

The Allen series consists of deep, strongly acid, well-drained soils that have developed in old alluvium. The parent material washed from the adjacent, higher lying Linker, Muskingum, Enders, and Montevallo soils, which developed from weathered sandstone, shale, and quartzite. The surface soils are primarily dark-grayish-brown fine sandy clay loam. Fragments of sandstone and quartzite, as large as 8 inches in diameter are on the surface and throughout the soil.

For the Anniston and Allen series soils, the depth to bedrock typically is 2 feet to greater than 10 feet bgs. The depth to the water table for this series is usually greater than 20 feet bgs.

### ***1.3 Scope of Work***

The scope of work, for activities associated with the SI at this site, specified by the statement of work (USACE, 1998), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Collect 12 surface soil samples, 5 surface water samples, and 5 sediment samples to determine if potential site-specific chemicals (PSSC) are present at the Golf Course, Parcel 178(7) site, and to provide data to determine any future planned corrective measures and closure activities.

At completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to evaluate the absence or presence of PSSC at this site, and to recommend further actions, if appropriate.



## ***2.0 Summary of Existing Environmental Studies***

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ESE conducted an EBS to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the CERFA (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, Alabama Department of Environmental Management (ADEM), U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Golf Course is identified as a CERFA site. This CERFA site is a parcel where pesticide, herbicide, and fertilizer products were applied to maintain the greens, fairways, and lawns of the Golf Course and were possibly released to the environment. The Golf Course site lacks adequate

documentation and therefore requires additional evaluation to determine the environmental condition of the parcel.

## **3.0 Site-Specific Data Quality Objectives**

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### **3.1 Overview**

The data quality objectives (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for the Golf Course. This section incorporates the components of the DQO process described in the EPA publication EPA 540-R-93-071, *Data Quality Objectives Process for Superfund, Interim Final Guidance* (EPA, 1993). The DQO process as applied to the Golf Course site is described in more detail in Sections 3.2 and 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and to establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

### **3.2 Data Users and Available Data**

The intended data users and available data related to the SI at the Golf Course, presented in Table 3-1, have been used to formulate a conceptual site exposure model (CSEM) presented in Section 3.3. This CSEM was developed to support the preparation of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual PSSC in the site media.

Table 3-1

**Summary of Data Quality Objectives  
Site Investigation  
The Golf Course, Parcel 178(7)  
Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other Contractors Possible future land users	None	<u>Contaminant Source</u> Golf Course	<u>Surface Soil</u>	SI to determine the presence or absence of contaminants in the site media  Definitive quality data for future decision making	<u>Surface soil</u> Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions	Definitive data in CESAS Level B data packages	12 surface soil samples + QC
		<u>Migration Pathways</u> - Erosion and runoff to surface water and sediment - Infiltration and leaching to sub-surface soil and groundwater - Volatilization and dust emission to air - Biotransfer to fish and venison	<u>Surface Water</u>		<u>Surface Water</u> Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions	Definitive data in CESAS Level B data packages	5 surface water samples + QC
			<u>Sediment</u>		<u>Sediment</u> Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions, TOC, Grain Size	Definitive data in CESAS Level B data packages	5 sediment samples + QC
		<u>Potential Receptors</u> Recreational site users (current and future); groundskeeper (current and future); construction worker (future); residents (future); venison and fish consumption (current and future)  <u>PSSC</u> Pesticides, herbicides, metals, and fertilizer chemicals					

ADEM - Alabama Department of Environmental Management.

CESAS - Corps of Engineers South Atlantic Savannah.

DOD - U.S. Department of Defense.

EPA - U.S. Environmental Protection Agency.

FTMC - Fort McClellan.

PSSC - Potential site-specific chemicals.

QC - Quality control.

VOC - Volatile organic compound.

TAL - Target analyte list.

TCL - Target Compound list.

TOC - Total organic carbon.

USACE - U.S. Army Corps of Engineers.

### **3.3 Conceptual Site Exposure Model - Human Health Evaluation**

The CSEM provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. The CSEM includes the receptors appropriate to plausible scenarios, and the potential exposure pathways. Graphically presenting possible pathways by which a potential receptor may be exposed, including sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health, and helps to ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

PSSC at this site may include pesticides, herbicides, and fertilizer chemicals applied to the Golf Course. Primary contaminant release would have been limited to the application of materials to surface grass and soil. Potential contaminant migration pathways include erosion and runoff to surface water and sediment in Cane Creek and its tributaries; dust emissions and volatilization to ambient air; infiltration and leaching to subsurface soil and groundwater; and biotransfer to fish and venison.

The entire site is currently used as a golf course. Plausible receptor scenarios under current site usage include the groundskeeper, recreational site user, and venison and fish consumption. Additional potential receptor scenarios considered but not included under current site usage include:

- Construction worker: The Golf Course is fully constructed with no additional construction taking place.
- Resident: The site is not currently used for residential purposes.

Future plans call for the site to continue functioning in its present capacity as a golf course and is not likely to change (FTMC, 1997). Application of lawn fertilizer, pesticides, and herbicides will continue to be a practice at the site. Because the proposed work is a limited site investigation,

detection of contamination to the soils will necessitate further evaluation and may ultimately include groundwater sampling. Therefore, the receptors identified under future site use include those identified under current site use. The residential and construction worker scenarios are added as additional measures of conservatism. The contaminant release and transport mechanisms, source and exposure media, receptors and exposure pathways are summarized in Figure 3-1 and Table 3-1.

### ***3.4 Decision-Making Process, Data Uses, and Needs***

The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at the Golf Course. Data uses and needs are summarized in Table 3-1.

#### ***3.4.1 Risk Evaluation***

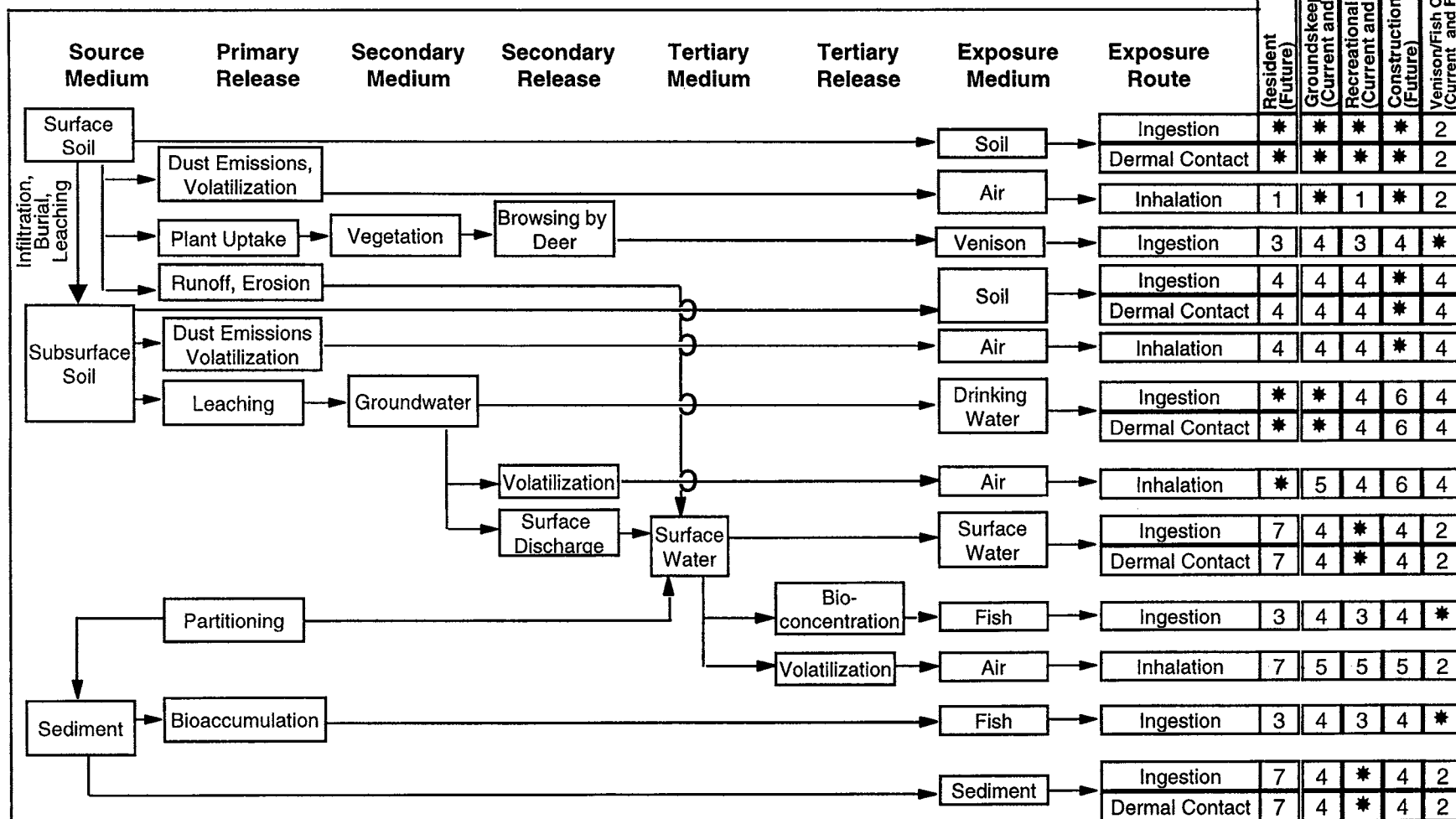
Confirmation of contamination at the Golf Course site will be based on comparing detected concentrations of chemicals with site-specific screening levels and background concentrations developed in the WP. EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in the installation-wide WP.

#### ***3.4.2 Data Types and Quality***

Surface soil, surface water, and sediment will be sampled and analyzed to meet the objectives of the SI for the Golf Course site. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

**Figure 3-1**  
**Human Health Conceptual Site Exposure Model for Golf Course, Parcel 178(7)**  
**Fort McClellan, Alabama**



\* = Complete exposure pathway quantified in SSSL development.

1 = Volatilization from undisturbed surface soil deemed insignificant; soil is likely to be paved or vegetated, reducing dust emissions to insignificant levels; inhalation pathway not quantified.

2 = This scenario is created to assess indirect (food chain) exposure to surface soil, surface water and sediment.

3 = Evaluated under venison and fish consumption scenario.

4 = Incomplete exposure pathway.

5 = Although theoretically complete, this pathway is judged to be insignificant.

6 = Although theoretically complete, these pathways are not quantified for the construction worker because SSSLs developed for the groundskeeper would be at least as restrictive.

7 = Although theoretically complete, SSSLs for these pathways are developed only for the recreational site user. SSSLs developed for the recreational site user may be used to estimate risk for this receptor.

### ***3.4.3 Precision, Accuracy, and Completeness***

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the approved QAP.



## **4.0 Field Activities**

---

### **4.1 Utility Clearances**

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where surface soil, surface water, and sediment soil samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are cleared, the stakes will be labeled as cleared.

### **4.2 Environmental Sampling**

The environmental sampling program during the SI at the Golf Course includes the collection of 12 surface soil samples, 5 surface water samples, and 5 sediment samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site in order to determine the environmental condition of the site and any further action to be conducted at the site.

#### **4.2.1 Surface Soil Sampling**

Surface soil samples will be collected from 12 locations at the Golf Course.

##### **4.2.1.1 Sample Locations and Rationale**

The surface soil sampling rationale is provided in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact surface soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

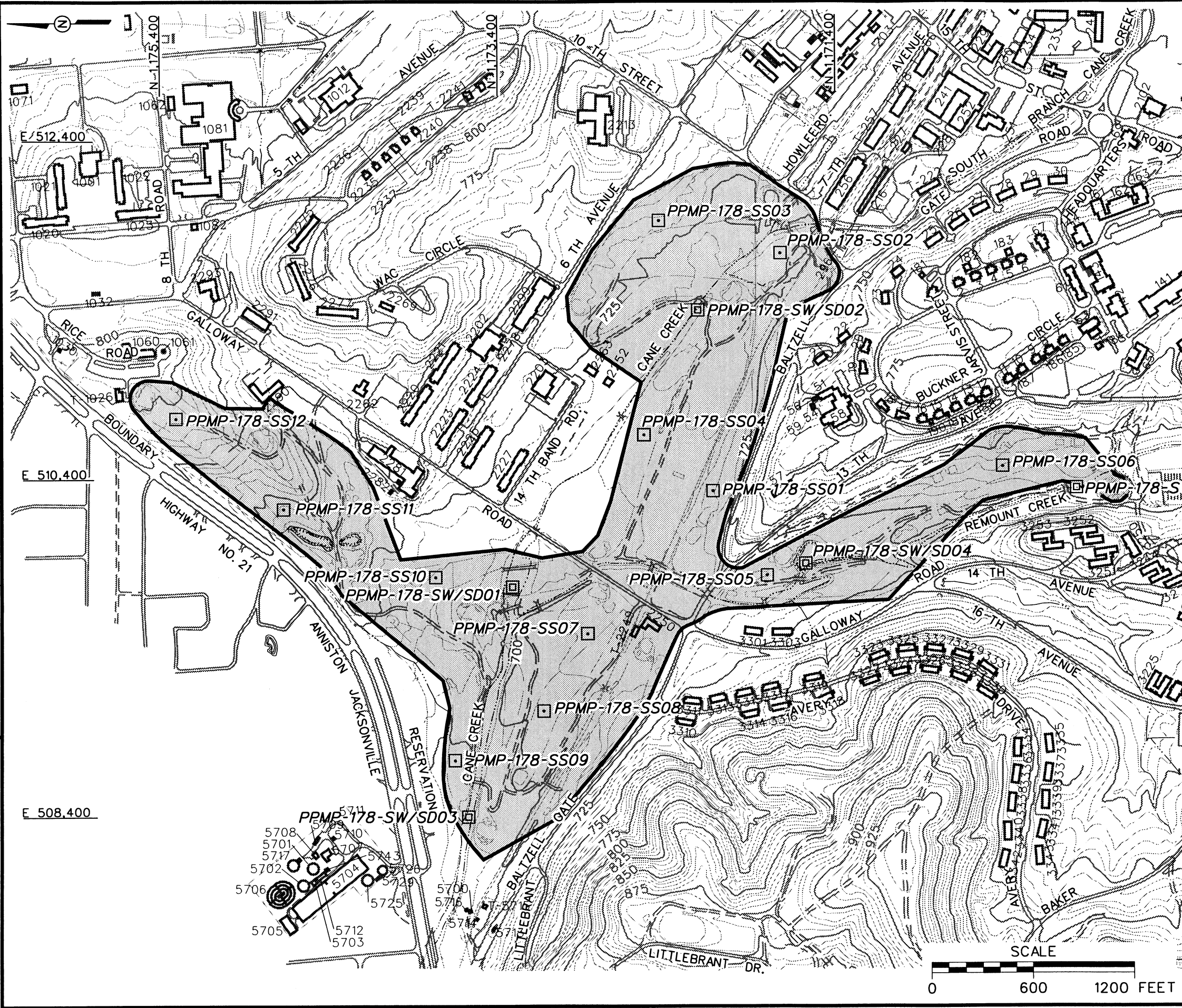
##### **4.2.1.2 Sample Collection**

Surface soil samples will be collected from the upper 1 foot of soil in accordance with the procedures specified in Section 4.9.1.1 of the approved SAP. Collected surface soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 this SFSP.

Table 4-1

**Sample Locations And Rationale**  
**The Golf Course, Parcel 178(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Media	Sample Location Rationale
PPMP-178-SS01	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS02	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS03	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS04	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS05	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS06	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS07	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS08	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS09	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS10	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS11	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SS12	Surface soil	Proposed surface soil sample. Sample data will indicate if PSSC releases have occurred and if contaminated surface soil exists from historical application of chemicals to maintain golf course greens, fairways and lawns.
PPMP-178-SW/SD01	Surface water and sediment	Sample location is a potential downgradient sink for PSSC from the site. Evidence of PSSC mobility within the site may likely be reflected at this location.
PPMP-178-SW/SD02	Surface water and sediment	Sample location is a potential downgradient sink for PSSC from the site. Evidence of PSSC mobility within the site may likely be reflected at this location.
PPMP-178-SW/SD03	Surface water and sediment	Sample location is a potential downgradient sink for PSSC from the site. Evidence of PSSC mobility within the site may likely be reflected at this location.
PPMP-178-SW/SD04	Surface water and sediment	Sample location is a potential downgradient sink for PSSC from the site. Evidence of PSSC mobility within the site may likely be reflected at this location.
PPMP-178-SW/SD05	Surface water and sediment	Sample location is a potential downgradient sink for PSSC from the site. Evidence of PSSC mobility within the site may likely be reflected at this location.



**LEGEND**

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- PROPOSED SURFACE WATER/SEDIMENT SAMPLE
- PROPOSED SURFACE SOIL SAMPLE

**FIGURE 4-1**  
**PROPOSED SAMPLE LOCATIONS**  
**GOLF COURSE**  
**PARCEL 178(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

**IT** INTERNATIONAL  
TECHNOLOGY  
CORPORATION

Table 4-2

**Surface Soil and Sediment Sample Designations and QA/QC Sample Quantities**  
**The Golf Course, Parcel 178(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-178-SS01	PPMP-178-SS01-SS-KA0001-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS02	PPMP-178-SS02-SS-KA0002-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS03	PPMP-178-SS03-SS-KA0003-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS04	PPMP-178-SS04-SS-KA0004-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS05	PPMP-178-SS05-SS-KA0005-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS06	PPMP-178-SS06-SS-KA0006-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS07	PPMP-178-SS07-SS-KA0007-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS08	PPMP-178-SS08-SS-KA0008-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS09	PPMP-178-SS09-SS-KA0009-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS10	PPMP-178-SS10-SS-KA0010-REG	0-1				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS11	PPMP-178-SS11-SS-KA0011-REG	0-1	PPMP-178-SS11-SS-KA0012-FD	PPMP-178-SS11-SS-KA0013-FS		Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SS12	PPMP-178-SS12-SS-KA0014-REG	0-1			PPMP-178-SS12-SS-KA0014-MS PPMP-178-SS12-SS-KA0014-MSD	Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SW/SD01	PPMP-178-SW/SD01-SD-KA1001-REG	0-0.5	PPMP-178-SW/SD01-SD-KA1002-FD			Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions, TOC, Grain Size
PPMP-178-SW/SD02	PPMP-178-SW/SD02-SD-KA1003-REG	0-0.5				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions, TOC, Grain Size
PPMP-178-SW/SD03	PPMP-178-SW/SD03-SD-KA1004-REG	0-0.5				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions, TOC, Grain Size

**Table 4-2**

**Surface Soil and Sediment Sample Designations and QA/QC Sample Quantities  
The Golf Course, Parcel 178(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-178-SW/SD04	PPMP-178-SW/SD04-SD-KA1006-REG	0-0.5				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions, TOC, Grain Size
PPMP-178-SW/SD05	PPMP-178-SW/SD05-SD-KA1007-REG	0-0.5				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions, TOC, Grain Size

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

TAL - Target analyte list.

TOC - Total organic carbon.

#### **4.2.2 Surface Water Sampling**

Five surface water samples will be collected from Cane Creek and Remount Creek which flow through the Golf Course.

##### **4.2.2.1 Sample Locations and Rationale**

The surface water sampling rationale is listed in Table 4-1. Surface water samples will be collected from the locations proposed on Figure 4-1. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-3. The exact sampling location will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

##### **4.2.2.2 Sample Collection**

Surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.3 Sediment Sampling**

Five sediment samples will be collected from Cane Creek (3 locations) and Remount Creek (2 locations) which transect the Golf Course site. The sediment samples will be collected at the same locations as the surface water samples described in Section 4.2.2.

##### **4.2.3.1 Sample Locations and Rationale**

The tentative locations for the sediment samples are shown in Figure 4-1. Sediment sampling rationale are presented in Table 4-1. Sediment sample designations and required QA/QC sample requirements are listed in Table 4-2. The actual sediment samples will be collected at the discretion of the ecological sampler based on the drainage pathways and actual field observations.

##### **4.2.3.2 Sample Collection**

Sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the

Table 4-3

**Surface Water Sample Designations and QA/QC Sample Quantities**  
**The Golf Course, Parcel 178(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-178-SW/SD01	PPMP-178-SW/SD01-SW-KA2001-REG	N/A	PPMP-178-SW/SD01-SW-KA2002-FD	PPMP-178-SW/SD01-SW-KA2003-FS		Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SW/SD02	PPMP-178-SW/SD02-SW-KA2004-REG	N/A				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SW/SD03	PPMP-178-SW/SD03-SW-KA2005-REG	N/A			PPMP-178-SW/SD03-SW-KA2005-MS PPMP-178-SW/SD03-SW-KA2005-MSD	Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SW/SD04	PPMP-178-SW/SD04-SW-KA2006-REG	N/A				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions
PPMP-178-SW/SD05	PPMP-178-SW/SD05-SW-KA2007-REG	N/A				Chlorinated Pesticides, Chlorinated Herbicides, Organophosphorus Pesticides, TAL Metals, Anions

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

N/A - not applicable.

QA/QC - Quality assurance/quality control.

REG - Field sample.

TAL - Target analyte list.

analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The sediment samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

### **4.3 Decontamination Requirements**

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP.

Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

### **4.4 Surveying of Sample Locations**

Sampling locations will be marked with pin flags, stakes, and/or flagging, and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site). Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

### **4.5 Analytical Program**

Samples collected at locations specified in Chapter 4.0 of this SFSP will be analyzed for the specific suites of chemicals and elements based the history of site usage, as well as the EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Golf Course site consist of the following list of analytical suites:

- Target analyte list metals - Method 6010B/7000
- Chlorinated pesticides - Method 8081A
- Chlorinated herbicides - Method 8051A
- Organophosphorus pesticides - Method 8141A
- Anions (bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate) - Method 300.0.



The sediment samples will be analyzed for the following list of parameters:

- Total Organic Carbon – Method 9060
- Grain Size – ASTM D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP).

Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

#### ***4.6 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping will follow the procedures as specified in Section 4.13.2 of the SAP. Completed analysis request/COC records will be secured and included with each shipment of coolers to the subcontract laboratory below:

Sample Receiving  
Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Telephone: (423) 588-6401.

Split samples collected for the USACE laboratory will be shipped to the following address:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060  
Telephone: (770) 919-5270.

#### ***4.7 Investigation-Derived Waste Management***

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at the Golf Course, Parcel 178(7) site will include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area around Buildings 335 and 336 while awaiting final disposal.

Table 4-4

**Analytical Samples  
Site Investigation  
The Golf Course, Parcel 178(7)  
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples <sup>a</sup>					Quanterra	QA Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
The Golf Course: 5 water matrix samples ( 5 surface water sample); 17 soil matrix samples (12 surface soil samples and 5 sediment samples)													
Cl Pesticides	8081A	water	normal	5	1	5	1	1	1	1	1	10	1
OP Pesticides	8141A	water	normal	5	1	5	1	1	1		1	9	1
Cl Herbicides	8151A	water	normal	5	1	5	1	1	1		1	9	1
Tot TAL Metals	6010B/7000	water	normal	5	1	5	1	1	1		1	9	1
Anions <sup>b</sup>	300.0	water	normal	5	1	5	1	1	1		1	9	1
Cl Pesticides	8081A	soil	normal	17	1	17	2	1	1		1	22	1
OP Pesticides	8141A	soil	normal	17	1	17	2	1	1		1	22	1
Cl Herbicides	8151A	soil	normal	17	1	17	2	1	1		1	22	1
TAL Metals	6010B/7000	soil	normal	17	1	17	2	1	1		1	22	1
Anions <sup>b</sup>	300.0	soil	normal	17	1	17	2	1	1		1	22	1
TOC	9060	sediment	normal	5	1	5						5	0
Grain Size	ASTM D-421/D-422	sediment	normal	5	1	5						5	0
The Golf Course Subtotal:						120	15	10	10	1	10	166	10

<sup>a</sup>Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up to the nearest whole number.

Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

<sup>b</sup>Anions = bromide, chloride, fluoride, nitrate, nitrite, phosphate, and sulfate.

Ship samples to:

Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Attn: John Reynolds  
Tel: 423-588-6401  
Fax: 423-584-4315

USACE Laboratory split samples  
are shipped to:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060-3112  
Tel: 770-919-5270

QA/QC - Quality assurance/quality control.  
MS/MSD - Matrix spike/matrix spike duplicate.  
TAL - Target analyte list.  
Cl - Chlorinated.  
OP - Organophosphorus.  
TOC - Total organic carbon.

#### ***4.8 Site-Specific Safety and Health***

Safety and health requirements for this SI are provided in the SSHP attachment for the Golf Course, Parcel 178(7). The SSHP attachment will be used in conjunction with the SHP.

## ***5.0 Project Schedule***

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The project schedule for the SI activities is provided by the IT project manager to the Base Realignment and Closure Cleanup Team on a monthly basis.

## 6.0 References

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Environmental Science and Engineering Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, prepared under contract to the Calhoun County Commission, November.

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U.S. Army Corps of Engineers (USACE), 1998, *Statement of Work for Task Order CK005, Modification No. 1, Site Investigations at Fort McClellan, Alabama, Including Ecological Screening Sites (Creeks and Tribs), and Removal of Indoor Firing Ranges*, May.

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U.S. Department of Agriculture (USDA), 1961, *Soil Survey, Calhoun County, Alabama*, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.

**Site Investigation**  
**Final**  
**Site-Specific Field Sampling Plan Attachment**  
**for the Former Printing Plant, Building 1060,**  
**Parcel 172(7)**

**Fort McClellan**  
**Calhoun County, Alabama**

**Prepared for:**

**U.S. Army Corps of Engineers, Mobile District**  
**109 St. Joseph Street**  
**Mobile, Alabama 36602**

**Prepared by:**

**IT Corporation**  
**312 Directors Drive**  
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**Delivery Order CK005**  
**Contract No. DACA21-96-D-0018**  
**IT Project No. 774645**

**December 1998**

**Revision 1**

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## **List of Acronyms**

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ADEM	Alabama Department of Environmental Management
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Program
COC	chain of custody
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
PID	photoionization detector
PSSC	potential site-specific chemicals
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
TCL	target compound list
USACE	U.S. Army Corps of Engineers
WP	installation-wide work plan

## ***Executive Summary***

---

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct site investigation activities at the Former Printing Plant, Building 1060, Parcel 172(7), Fort McClellan (FTMC), Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the Former Printing Plant, Building 1060 site.

Formerly, printing operations have been conducted at four locations at FTMC, including Building 1060. Printing operations began here at an undocumented date and continued until 1973 (Environmental Science and Engineering, Inc. [ESE], 1998). Building 1060 is located south of the Galloway Gate at the northwestern edge of the Main Post. The building is located on Rice Road at the north end of the Golf Course. Building 1060, the current location of the Headquarters of the Chemical Battalion at FTMC, was originally built in 1954 (Environmental Science and Engineering, Inc., 1998). This building is on a small wooded hill. A small seep is on the slope of the hill approximately 125 feet to the east of Building 1060. There was not any other information concerning this location identified during the environmental baseline survey (ESE, 1998).

Potential contaminant sources at the Former Printing Plant, Building 1060 site may have included printing fluids, solvents and metals. IT will collect four surface soil samples, four subsurface soil samples, one seep water sample, and one sediment sample at this site. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, and metals. Results from these analyses will be compared with site-specific screening levels specified in the installation wide work plan, and regulatory agency contaminant guidelines.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for the Former Printing Plant, Building 1060, Parcel 172(7) will be used in conjunction with the site-specific safety and health plan (SSHP), and the installation-wide work plan (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

## **1.0 Project Description**

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### **1.1 Introduction**

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Former Printing Plant, Building 1060, under Delivery Order CK005, Contract No. DACA21-96-D-0018.

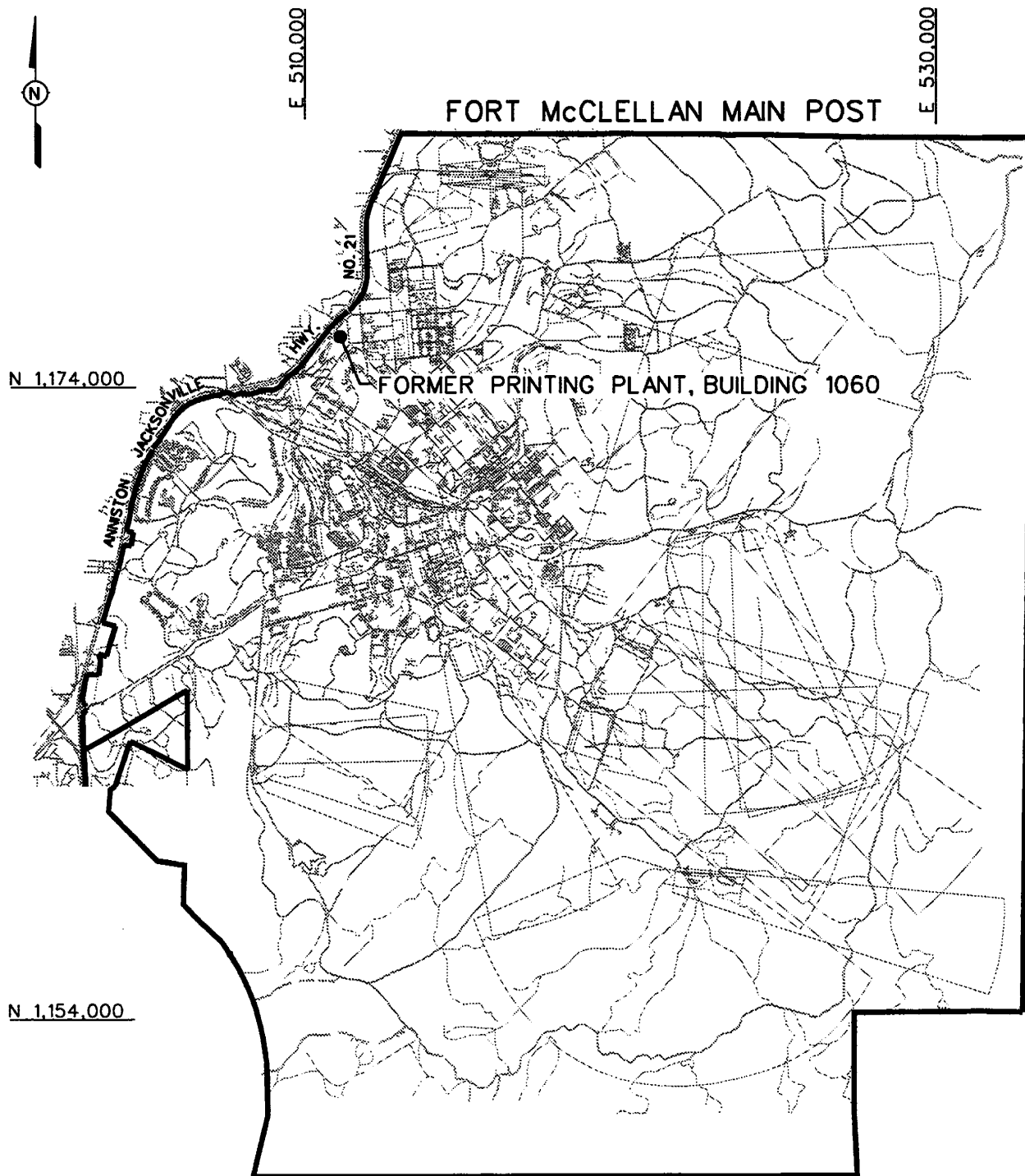
This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC, Calhoun County, Alabama, has been prepared to provide technical guidance for sample collection and analysis at the Former Printing Plant, Building 1060, Parcel 172(7). The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Former Printing Plant, Building 1060, and the installation-wide work plan (WP) (IT, 1998b), and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP).

### **1.2 Site Description**


Formerly, printing operations have been conducted at four locations at FTMC, including Building 1060. Printing operations began here at an undocumented date and continued until 1973 (Environmental Science and Engineering, Inc. [ESE], 1998). Building 1060 is located south of the Galloway Gate at the northwestern edge of the Main Post (Figure 1-1). The building is located on Rice Road at the north end of the Golf Course (Figure 1-2). Building 1060, the current location of the Headquarters of the Chemical Battalion at FTMC, was originally built in 1954 (Environmental Science and Engineering, Inc. [ESE], 1998). The building is located on a small wooded hill. There is a small seep on the slope of the hill approximately 125 feet to the east of Building 1060 (Figure 1-2). There was not any other information concerning this location identified during the environmental baseline study (ESE, 1998).

The elevation at the Former Printing Plant, Building 1060, Parcel 172(2) is approximately 800 feet. The soils found at this site are composed of the Montevallo series soils. The Montevallo series consists of shallow, well drained strongly acid soils. This soil series has developed in the residuum of interbedded shale and fine-grained sandstone or limestone. Where these soils are not eroded, the surface soil is very dark grayish-brown to very dark brown shaly silt loam. The subsoil is a yellowish-brown shaly silt loam. Fragments of shale, less than 2 inches square, are

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# **LEGEND:**

 FORT McCLELLAN BOUNDARY

**FIGURE 1-1**  
**SITE LOCATION MAP**  
**FORMER PRINTING PLANT,**  
**BUILDING 1060**  
**PARCEL 172(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

SCALE  
0 5000 10000 FEET

**IT** INTERNATIONAL  
TECHNOLOGY  
CORPORATION

30 NOV 98	STARTING DATE: 07/06/98	DATE LAST P.L.	DRAFT. CHCK. BY:	INITIATOR: J. RAGSDALE	DWG. NO.: 45es.124
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LEGEND	
	UNIMPROVED ROADS AND PARKING
	PAVED ROADS AND PARKING
	BUILDING
	TOPOGRAPHIC CONTOURS
	PARCEL BOUNDARY
	FENCE
	SEEP
	SANITARY SEWER LINE
	STORM DRAINAGE LINE

**FIGURE 1-2**  
**SITE MAP**  
 FORMER PRINTING PLANT,  
 BUILDING 1060  
 PARCEL 172(7)  
 U. S. ARMY CORPS OF ENGINEERS  
 MOBILE DISTRICT  
 FORT McCLELLAN  
 CALHOUN COUNTY, ALABAMA  
 Contract No. DACA21-96-D-0018

**IT** INTERNATIONAL  
 TECHNOLOGY  
 CORPORATION

commonly in the soil. The depth to bedrock typically ranges from 1 foot to 1.5 feet below ground surface (bgs). The depth to the water table for this series is usually greater than 20 feet bgs.

Soils at this site fall into the mapping unit of Motevallo shaly silty clay loam, 10 to 40 percent slopes, severely eroded (MtD3). This mapping unit consists of soils that have developed in residuum on upland. Erosion has removed all or nearly all of the original surface soil. The color of the 2 to 4 inch surface soil is a yellowish-brown shaly silty clay loam (U.S. Department of Agriculture, 1961).

### ***1.3 Scope of Work***

The scope of work for activities associated with the SI at the Former Printing Plant, Building 1060 site, specified by the statement of work (USACE, 1998), includes the following tasks:

- Develop the SFSP attachment
- Develop the SSHP attachment
- Collect four surface soil samples, four subsurface soil samples, one seep water sample, and one sediment sample to determine whether potential site-specific chemicals (PSSC) are present at the Former Printing Plant, Building 1060 site and to provide data to determine any future planned corrective measures and closure activities.

At completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to evaluate the absence or presence of PSSC at this site, and to recommend further actions, if appropriate.

## ***2.0 Summary of Existing Environmental Studies***

---

ESE conducted an EBS to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, Alabama Department of Environmental Management (ADEM), U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

There were not any previous studies performed at this site referenced in the EBS (ESE, 1998). The Former Printing Plant, Building 1060 is identified as a Category 7 CERFA site. This CERFA site is a parcel where printing fluids, solvents, and petroleum products were probably stored, and possibly released onto the site or to the environment, and/or were disposed of on site



property. The Former Printing Plant, Building 1060 lacks adequate documentation and therefore requires additional evaluation to determine the environmental condition of the parcel.

## **3.0 Site-Specific Data Quality Objectives**

---

### **3.1 Overview**

The data quality objectives (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for the Former Printing Plant, Building 1060 site. This section incorporates the components of the DQO process described in the EPA publication EPA 540-R-93-071, *Data Quality Objectives Process for Superfund, Interim Final Guidance* (EPA, 1993). The DQO process as applied to the Former Printing Plant, Building 1060 site is described in more detail in Sections 3.2 and 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, the procedures necessary to meet the objectives of the SI, and to establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

### **3.2 Data Users and Available Data**

The intended data users and available data related to the SI at the Former Printing Plant, Building 1060 site, presented in Table 3-1, have been used to formulate a conceptual site exposure model (CSEM) presented in Section 3.3. This CSEM was developed to support the preparation of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual PSSC in the site media.

Table 3-1

**Summary of Data Quality Objectives**  
**Site Investigation,**  
**Former Printing Plant, Building 1060, Parcel 172(7)**  
**Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other Contractors Possible future land users	None	<u>Contaminant Source</u> Former Printing Plant Facility  <u>Migration Pathways</u> Infiltration to surface soil, infiltration and leaching to groundwater, discharge of groundwater to surface seep, dust emissions and volatilization to ambient air.  <u>Potential Receptors</u> Groundskeepers (current and future), construction workers (future), resident (future) and recreational site user (future)  <u>PSSC</u> Printing fluids, solvents, and metals	<u>Surface Soil</u>	SI to determine the presence of COPC in the site media	<u>Surface soil</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	4 direct-push soil samples + QC
			<u>Subsurface Soil</u>				
			<u>Surface Water</u>	Definitive quality data for future decision making	<u>Subsurface Soil</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	4 direct-push soil samples + QC
			<u>Sediment</u>		<u>Seep Water</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	1 seep water sample + QC
					<u>Sediment</u> TCL VOCs, TCL SVOCs, TAL Metals TOC, Grain Size	Definitive data in CESAS Level B data packages	1 sediment sample + QC

ADEM - Alabama Department of Environmental Management.

CESAS - Corps of Engineers South Atlantic Savannah.

COPC - Chemical of potential concern.

DOD - U.S. Department of Defense.

EPA - U.S. Environmental Protection Agency.

FTMC - Fort McClellan.

PSSC - Potential site-specific chemicals.

SI - Site investigation.

QC - Quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

USACE - U.S. Army Corps of Engineers.

VOC - Volatile organic compound.

### **3.3 Conceptual Site Exposure Model - Human Health Evaluation**

The CSEM provides the basis for identifying and evaluating the potential risks to human health during the risk assessment process. The CSEM includes the receptors appropriate to all plausible scenarios, and the potential exposure pathways. Graphically presenting possible pathways by which a potential receptor may be exposed, including sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health, and helps to ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

PSSC at this site may include printing fluids, solvents, and metals. Primary contaminant release, if any, was probably to the surface soil. Potential contaminant transport pathways include infiltration to subsurface soil, infiltration and leaching to shallow groundwater, discharge of groundwater to the surface at the seep just east of the site, dust emissions and volatilization to ambient air. The surface water seep is considered to reflect shallow groundwater, which is conservatively assumed to be developed as a source of potable water for future site use. Thus, groundwater sampling and analysis may be required if the subsurface soil and seep water contains detectable PSSC.

Currently, Building 1060 is used as an office building. The only plausible receptors under current site usage scenario is the groundskeeper. Other potential current receptor scenarios considered but not included under current site usage include:

- Recreational site user: There is nothing at this site that would attract a recreational site user. The grounds surrounding the building does not lend itself to recreational use.
- Resident: The site is not currently used for residential purposes.
- Venison consumption: The site does not offer habitat or browse for deer or the opportunity for hunting.

- Fish consumption: There are not any nearby bodies of surface water affected by the site that can support substantive sport fishing.

The future projected use of Building 1060 is unclear. It may continue as an office building or be converted to other uses (FTMC, 1997). Additional industrial or residential development is unlikely, yet possible. Plausible receptors under the future site use scenario(s) include the recreational site user, groundskeeper, construction worker, and resident. The fish and venison consumption scenarios are not evaluated under the future site use scenario for the reasons provided above for current site usage. The contaminant release and transport mechanisms, source and exposure media, receptors and exposure pathways are summarized in Table 3-1 and Figure 3-1.

### ***3.4 Decision-Making Process, Data Uses, and Needs***

The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at the Former Printing Plant, Building 1060 site. Data uses and needs are summarized in Table 3-1.

#### ***3.4.1 Risk Evaluation***

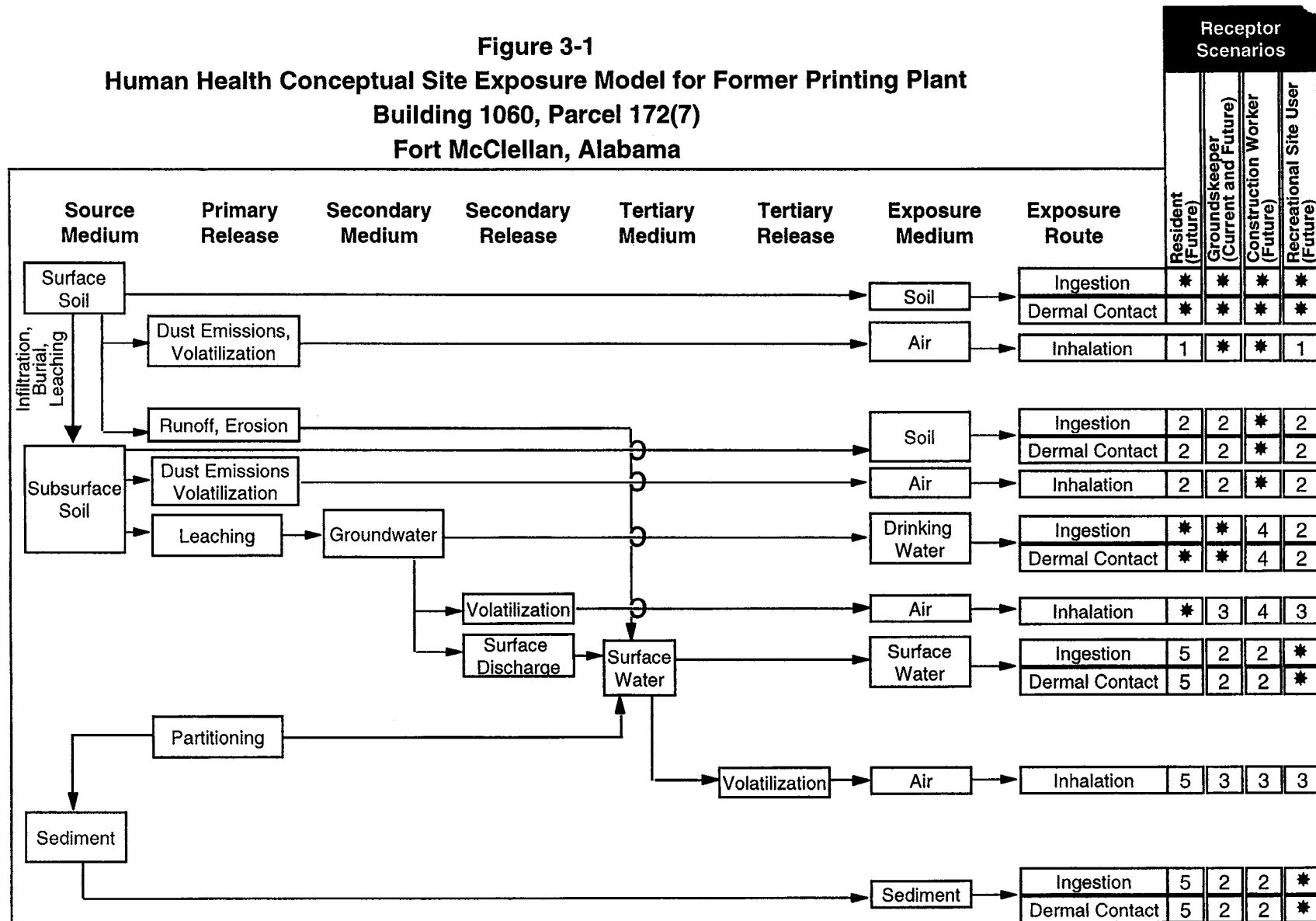
Confirmation of contamination at the Former Printing Plant, Building 1060, will be based on comparing detected PSSC with site-specific screening levels and background concentrations developed in the WP. EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in the installation-wide work plan.

#### ***3.4.2 Data Types and Quality***

Surface and subsurface soil, seep water, and sediment will be sampled and analyzed to meet the objectives of the SI at the Former Printing Plant, Building 1060 site. Quality assurance/ quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

**Figure 3-1**  
**Human Health Conceptual Site Exposure Model for Former Printing Plant**  
**Building 1060, Parcel 172(7)**  
**Fort McClellan, Alabama**



\* = Complete exposure pathway quantified in SSSL development.

1 = Volatilization from undisturbed surface soil deemed insignificant; soil is likely to be paved or vegetated, reducing dust emissions to insignificant levels; inhalation pathway not quantified.

2 = Incomplete exposure pathway.

3 = Although theoretically complete, this pathway is judged to be insignificant.

4 = Although theoretically complete, these pathways are not quantified for the construction worker because SSSLs developed for the groundskeeper would be at least as restrictive.

5 = Although theoretically complete, SSSLs for these pathways are developed only for the recreational site user. SSSLs developed for the recreational site user may be used to estimate risk for this receptor.

### ***3.4.3 Precision, Accuracy, and Completeness***

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Chapter 9.0 of the QAP.

## **4.0 Field Activities**

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### **4.1 Utility Clearances**

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where surface soil, subsurface soil, surface water, and sediment samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are cleared, the stakes will be labeled as cleared.

### **4.2 Environmental Sampling**

The environmental sampling program during the SI at the Former Printing Plant, Building 1060 site includes the collection of four surface soil samples, four subsurface soil samples, one seep water sample, and one sediment sample for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site.

#### **4.2.1 Surface Soil Sampling**

Surface soil samples will be collected from four soil borings installed at the Former Printing Plant, Building 1060 site.

##### **4.2.1.1 Sample Locations and Rationale**

The surface soil sampling rationale is provided in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2.

##### **4.2.1.2 Sample Collection Procedures**

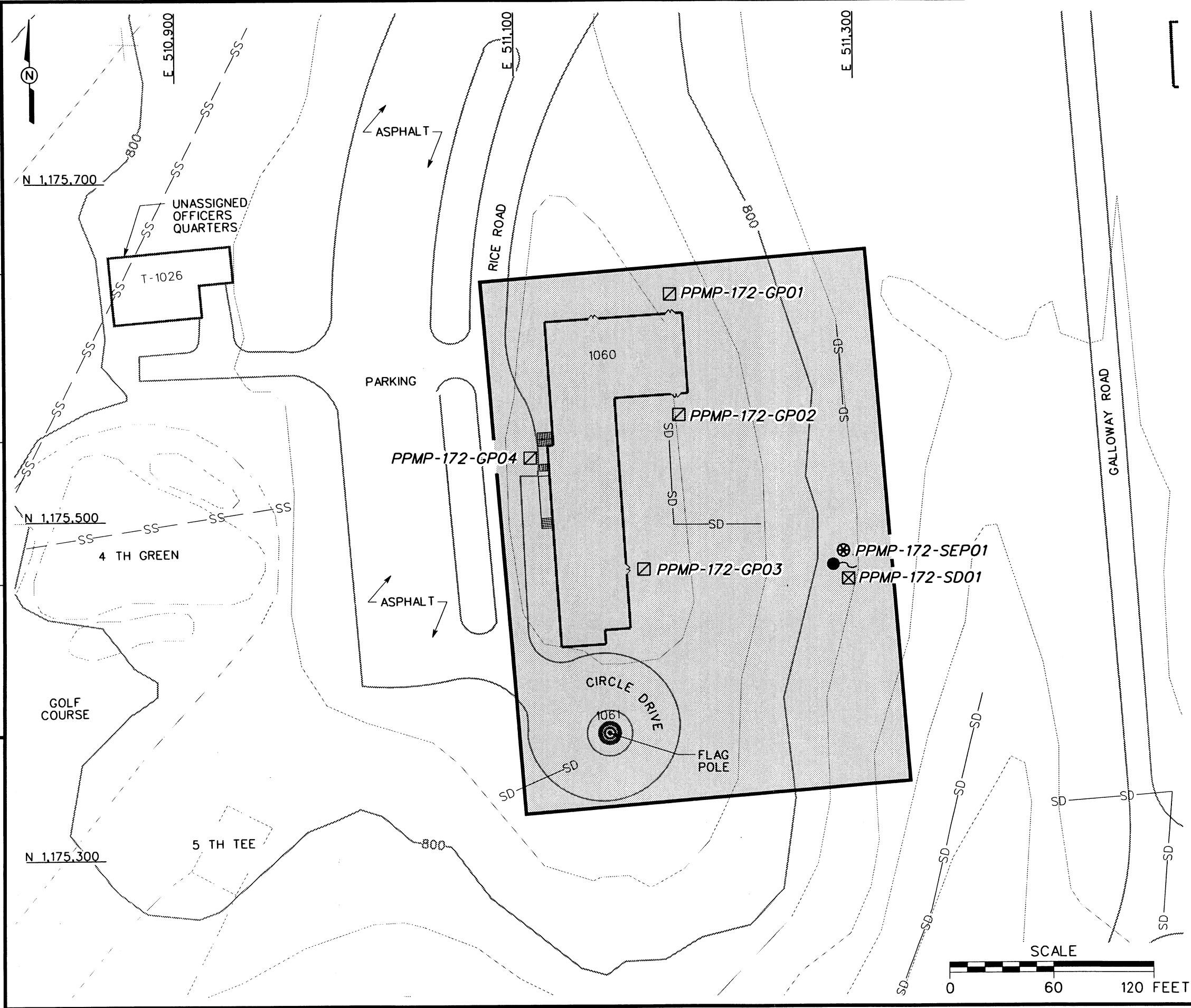
Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology in accordance with the procedures specified in Section 4.7.1.1 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Samples will be screened with the PID for information, only, not to select which sample is selected for analysis. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.



Table 4-1

**Sample Locations and Rationale**  
**Former Printing Plant, Building 1060, Parcel 172(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Media	Sample Location Rationale
PPMP-172-GP01	Surface soil and subsurface soil	Proposed boring is located near doors at northeast corner of Building 1060. Sample data will indicate if potential site-specific chemical (PSSC) releases have occurred through doors to building and if contaminated surface soil exists from historical use of Building 1060 as a printing plant.
PPMP-172-GP02	Surface soil and subsurface soil	Proposed boring is located near doors at northeast corner of Building 1060. Sample data will indicate if potential site-specific chemical (PSSC) releases have occurred through doors to building and if contaminated surface soil exists from historical use of Building 1060 as a printing plant.
PPMP-172-GP03	Surface soil and subsurface soil	Proposed boring is located near doors at northeast corner of Building 1060. Sample data will indicate if potential site-specific chemical (PSSC) releases have occurred through doors to building and if contaminated surface soil exists from historical use of Building 1060 as a printing plant.
PPMP-172-GP04	Surface soil and subsurface soil	Proposed boring is located near doors at northeast corner of Building 1060. Sample data will indicate if potential site-specific chemical (PSSC) releases have occurred through doors to building and if contaminated surface soil exists from historical use of Building 1060 as a printing plant.
PPMP-172-SD01	Sediment	Sample location is a surface discharge of groundwater (seep). Evidence of PSSC mobility in shallow groundwater beneath Building 1060 may be reflected at this groundwater discharge to the surface.
PPMP-172-SEP01	Seep water	Sample location is a surface discharge of groundwater (seep). Evidence of PSSC mobility in shallow groundwater beneath Building 1060 may be reflected at this groundwater discharge to the surface.



- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - PAVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS
  - PARCEL BOUNDARY
  - FENCE
  - SEEP
  - PROPOSED SEDIMENT SOIL SAMPLE
  - PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE
  - SS SANITARY SEWER LINE
  - SD STORM DRAINAGE LINE
  - PROPOSED SEEP WATER SAMPLE

**FIGURE 4-1**  
**PROPOSED SAMPLE LOCATIONS**  
**FORMER PRINTING PLANT,**  
**BUILDING 1060**  
**PARCEL 172(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

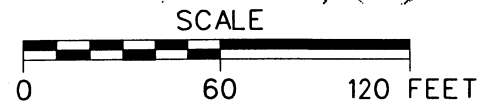


Table 4-2

**Soil, Sediment, and Surface Water Sample Designations and QA/QC Sample Quantities**  
**Former Printing Plant, Building 1060, Parcel 172(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Matrix	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
PPMP-172-GP01	Soil	PPMP-172-GP01-SS-KA0001-REG	0-1	PPMP-172-GP01-SS-KA0002-FD	PPMP-172-GP01-SS-KA0003-FS		TCL VOCs, TCL SVOCs, TAL Metals
	Soil	PPMP-172-GP01-DS-KA0004-REG	"				
PPMP-172-GP02	Soil	PPMP-172-GP02-SS-KA0005-REG	0-1			PPMP-172-GP02-DS-KA0006-MS PPMP-172-GP02-DS-KA0006-MSD	TCL VOCs, TCL SVOCs, TAL Metals
	Soil	PPMP-172-GP02-DS-KA0006-REG	"				
PPMP-172-GP03	Soil	PPMP-172-GP03-SS-KA0007-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	Soil	PPMP-172-GP03-DS-KA0008-REG	"				
PPMP-172-GP04	Soil	PPMP-172-GP04-SS-KA0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	Soil	PPMP-172-GP04-DS-KA0010-REG	"				
PPMP-172-SD01	Sediment	PPMP-172-SW/SD01-SD-KA1001-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size
PPMP-172-SEP01	Seep Water	PPMP-172-SW/SD01-SW-KA2001-REG	N/A	PPMP-172-SW/SD01-SW-KA2002-FD	PPMP-172-SW/SD01-SW-KA2003-FS	PPMP-172-SW/SD01-SW-KA2001-MS PPMP-172-SW/SD01-SW-KA2001-MSD	TCL VOCs, TCL SVOCs, TAL Metals

\* Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

#### **4.2.2 Subsurface Soil Sampling**

Subsurface soil samples will be collected from four soil borings installed at the Former Printing Plant, Building 1060 site. These soil borings will be installed as described in Section 4.2.1.1.

##### **4.2.2.1 Sample Locations and Rationale**

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations.

##### **4.2.2.2 Sample Collection Procedures**

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soils samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP.

Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

Soil samples will be collected continuously for 12 feet or until either groundwater or refusal is reached. A detailed lithologic log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field screened using a PID in accordance with Section 4.13 of the SAP to measure samples exhibiting elevated readings above background (ambient air).

Typically, the sample showing the highest reading will be selected and sent to the laboratory for analysis. If none of the samples collected indicate elevated readings above background using the PID, then the deepest interval collected will be submitted to the laboratory for analysis.

Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects potential PSSC at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSC and/or additional sample data would provide insight to the existence of any PSSC.

### **4.2.3 Seep Water Sampling**

One seep water sample will be collected from the groundwater seep located on the east side of the Former Printing Plant, Building 1060 site.

#### **4.2.3.1 Sample Locations and Rationale**

The seep water sampling rationale is listed in Table 4-1. The seep water sample will be collected from the location proposed on Figure 4-1. The seep water sample designation and required QA/QC sample requirements are listed in Table 4-2.

#### **4.2.3.2 Sample Collection Procedures**

The seep water sample will be collected similar to surface water and in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.1.1 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The sample will be analyzed for the parameters listed in Section 4.5.

### **4.2.4 Sediment Sampling**

One sediment sample will be collected from the area around the seep on the east side of the Former Printing Plant, Building 1060 site. The sediment sample will be collected at the same location as the seep water sample described in Section 4.2.3.

#### **4.2.4.1 Sample Locations and Rationale**

The location for the sediment sample is shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. Sediment sample designations and required QA/QC sample requirements are listed in Table 4-2.

#### **4.2.4.2 Sample Collection Procedures**

The sediment sample will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.1.3 of the SAP. The sediment sample will be analyzed for the parameters listed in Section 4.5.

### **4.3 Decontamination Requirements**

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP.

Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

#### **4.4 Surveying of Sample Locations**

Sampling locations will be marked with pin flags, stakes, and/or flagging, and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site). Horizontal coordinates for soil, sediment, and seep water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use temporary wells to determine water levels, a higher level of accuracy is required.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

#### **4.5 Analytical Program**

Samples collected at locations specified in Chapter 4.0 of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as the EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Former Printing Plant, Building 1060 site consist of the following list of analytical suites:

- Target compound list (TCL) volatile organic compounds - Method 5035/8260B
- TCL semivolatile organic compounds - Method 8270C
- Target analyte list metals - Method 6010B/7000.

In addition, the sediment sample will be analyzed for the following list of parameters:

- Total organic carbon - Method 9060
- Grain size - ASTM D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-3 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like

Table 4-3

**Analytical Samples  
Site Investigation  
Former Printing Plant, Building 1060, Parcel 172(7)  
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples*					Quanterra	QA Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
Former Printing Plant, Building 1060: 1 water matrix sample ( 1 seep water sample); 9 soil matrix samples (4 surface soil samples, 4 subsurface soil samples and 1 sediment sample)													
TCL VOCs	8260B	water	normal	1	1	1	1	1	1	1	1	6	1
TCL SVOCs	8270C	water	normal	1	1	1	1	1	1		1	5	1
Tot TAL Metals	6010B/7000	water	normal	1	1	1	1	1	1		1	5	1
TCL VOCs	8260B	soil	normal	9	1	9	1	1	1		1	13	1
TCL SVOCs	8270C	soil	normal	9	1	9	1	1	1		1	13	1
Tot TAL Metals	6010B/7000	soil	normal	9	1	9	1	1	1		1	13	1
TOC	9060	sediment	normal	1	1	1						1	0
Grain Size	ASTM D-421/D-422	sediment	normal	1	1	1						1	0
Former Printing Plant, Building 1060 Total:						32	6	6	6	1	6	57	6

\*Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.

Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:

Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Attn: John Reynolds  
Tel: 423-588-6401  
Fax: 423-584-4315

USACE Laboratory split samples  
are shipped to:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060-3112  
Tel: 770-919-5270

MS/MSD - Matrix spike/matrix spike duplicate.  
QA/QC - Quality assurance/quality control.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.  
TCL - Target compound list.  
TOC - Total organic carbon.  
VOC - Volatile organic compound.

forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

#### ***4.6 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP. Completed analysis request/COC records will be secured and included with each shipment of coolers to the subcontract laboratory below:

Sample Receiving  
Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Telephone: (423) 588-6401.

Split samples collected for the USACE laboratory will be shipped to the following address:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060  
Telephone: (770) 919-5270.

#### ***4.7 Investigation-Derived Waste Management***

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at the Former Printing Plant, Building 1060 site will include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area around Buildings 335 and 336 while awaiting final disposal.

#### ***4.8 Site-Specific Safety and Health***

Safety and health requirements for this SI are provided in the SSHP attachment for the Former Printing Plant, Building 1060, Parcel 172(7). The SSHP attachment will be used in conjunction with the SHP.



## ***5.0 Project Schedule***

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The project schedule for the SI activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team on a monthly basis.

## 6.0 References

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Environmental Science and Engineering Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, prepared under contract to the Calhoun County Commission, November.

IT Corporation (IT), 1998a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, August.

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U.S. Army Corps of Engineers (USACE), 1998, *Statement of Work for Task Order CK005, Modification No. 1, Site Investigations at Fort McClellan, Alabama, Including Ecological Screening Sites (Creeks and Tribs), and Removal of Indoor Firing Ranges*, May.

U.S. Army Corps of Engineers (USACE), 1994, *Requirements for the Preparation of Sampling and Analysis Plans*, Engineer Manual EM 200-1-3, September 1.

U.S. Department of Agriculture (USDA), 1961, *Soil Survey, Calhoun County, Alabama*, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.

**Site Investigation**

**Final**

**Site-Specific Field Sampling Plan Attachment**  
**for the Bulk Storage Area, Building 296, Parcel 60(6)**

**Fort McClellan**  
**Calhoun County, Alabama**

**Prepared for:**

**U.S. Army Corps of Engineers, Mobile District**  
**109 St. Joseph Street**  
**Mobile, Alabama 36602**

**Prepared by:**

**IT Corporation**  
**312 Directors Drive**  
**Knoxville, Tennessee 37923**

**Delivery Order CK005**  
**Contract No. DACA21-96-D-0018**  
**IT Project No. 774645**

**December 1998**

**Revision 1**

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## **List of Acronyms**

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ADEM	Alabama Department of Environmental Management
AST	aboveground storage tank
bgs	below ground surface
CLP	Contract Laboratory Program
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
COC	chain of custody
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
PAH	polynuclear aromatic hydrocarbon
PID	photoionization detector
PSSC	potential site-specific chemical
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
TCL	target compound list
USACE	U.S. Army Corps of Engineers
WP	installation-wide work plan

## ***Executive Summary***

---

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct site investigation activities at the Bulk Storage Area, Building 296 site, Parcel 60(6), at Fort McClellan (FTMC), Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the Bulk Storage Area, Building 296, Parcel 60(6) site.

The Bulk Storage Area, Building 296, Parcel 60(6), was a bulk storage site for seven aboveground storage tanks (AST) that was used for storage of heating oil. Six of the ASTs had a capacity of 25,000 gallons each and one had a capacity of 10,000 gallons. FTMC removed the seven ASTs in 1997 (Jaye, 1998). A concrete berm around the Bulk Storage Area concrete pad has also been removed. There are not any reported releases for this site (Environmental Science and Engineering, Inc. [ESE], 1998). The site is located in the central area of the FTMC Main Post. The site is northeast of the intersection of 10th Street with Baltzell Gate Road and at east end of the Golf Course. The South Branch of Cane Creek borders the site on the southeast and flows northwest past the site. All that remains at this site is a large concrete pad. There is not any evidence of the ASTs at the site; however, review of past aerial photographs appear to show the ASTs were located off of the concrete pad along the southern edge of the site. The Mobile District, U.S. Army Corps of Engineers, collected soil samples at this site in 1996, prior to the removal of the aboveground storage tanks, and analyzed for polynuclear aromatic hydrocarbons (PAH). PAHs were undetected in all the samples.

Potential contaminant sources at the Bulk Storage Area, Building 296 site include primarily heating oil and other petroleum products. IT will collect two subsurface soil samples, five groundwater samples, one surface water sample, one sediment sample, and three depositional soil samples at this site. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, and metals. Results from these analyses will be compared with site-specific screening levels specified in the installation wide work plan and regulatory agency guidelines.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for the Bulk Storage Area, Building 296, Parcel 60(6) will be used in conjunction with the site-specific safety and health plan (SSHP), and the installation-wide work plan (IT, 1998b) and SAP.



The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

## **1.0 Project Description**

---

### **1.1 Introduction**

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Bulk Storage Area, Building 296, Parcel 60(6), under Delivery Order CK005, Contract No. DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC, has been prepared to provide technical guidance for sample collection and analysis at the Bulk Storage Area, Building 296, Parcel 60(6) site. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Bulk Storage Area, Building 296, Parcel 60(6) site, and the installation-wide work plan (WP) (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP).

### **1.2 Site Description**

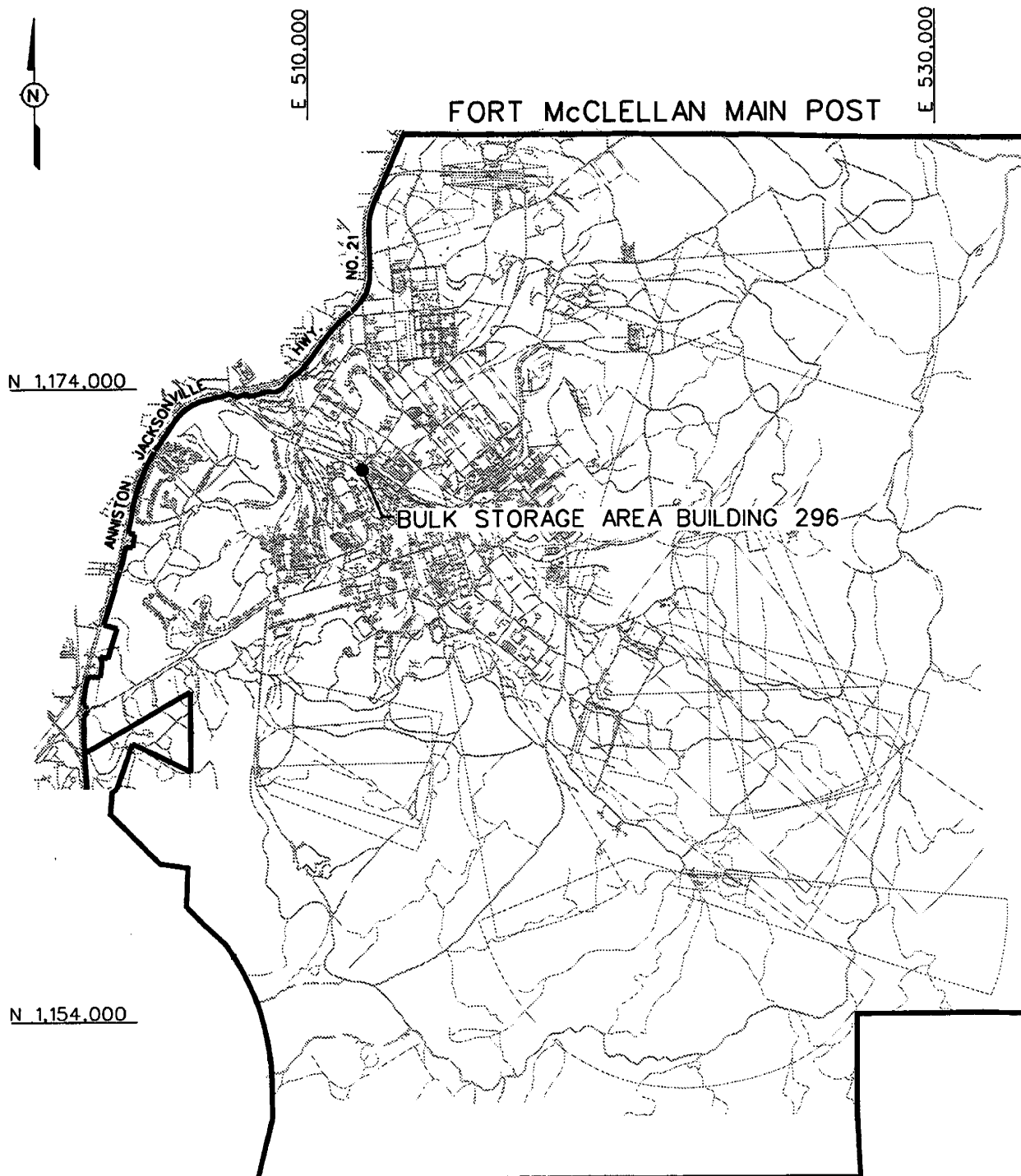
The Bulk Storage Area, Building 296, Parcel 60(6), was a bulk storage site for seven aboveground storage tanks (AST) that were used for storage of heating oil. Six of these ASTs had a capacity of 25,000 gallons, and one had a capacity of 10,000 gallons. There are not any tanks remaining at the site and all that remains at the site is a concrete pad. The concrete pad covers less than 1 acre. A review of past aerial photographs appear to show that the ASTs were located off of the concrete pad and lined up in a north and south direction along the southern edge of the site. FTMC removed the seven ASTs in 1997 (Jaye, 1998). A concrete berm around the Bulk Storage Area has been removed. A pipeline formerly connected the Bulk Storage Area and the General Services Area to the east. There have not been any reported releases at the site (Environmental Science and Engineering, Inc. [ESE], 1998). Bulk Storage Area, Building 296, Parcel 60(6) is located on the FTMC Main Post on 10th Street (Figure 1-1). The site is northeast of the intersection of 10th Street with Baltzell Gate Road and at east end of the Golf Course (Figure 1-2). The South Branch of Cane Creek borders the site on the southeast as it flows northwest past the site.

The soils at this site are categorized as the Philo and Stendal series. The Philo series consists of strongly acid, moderately well drained soils that are developing in local and general alluvium.


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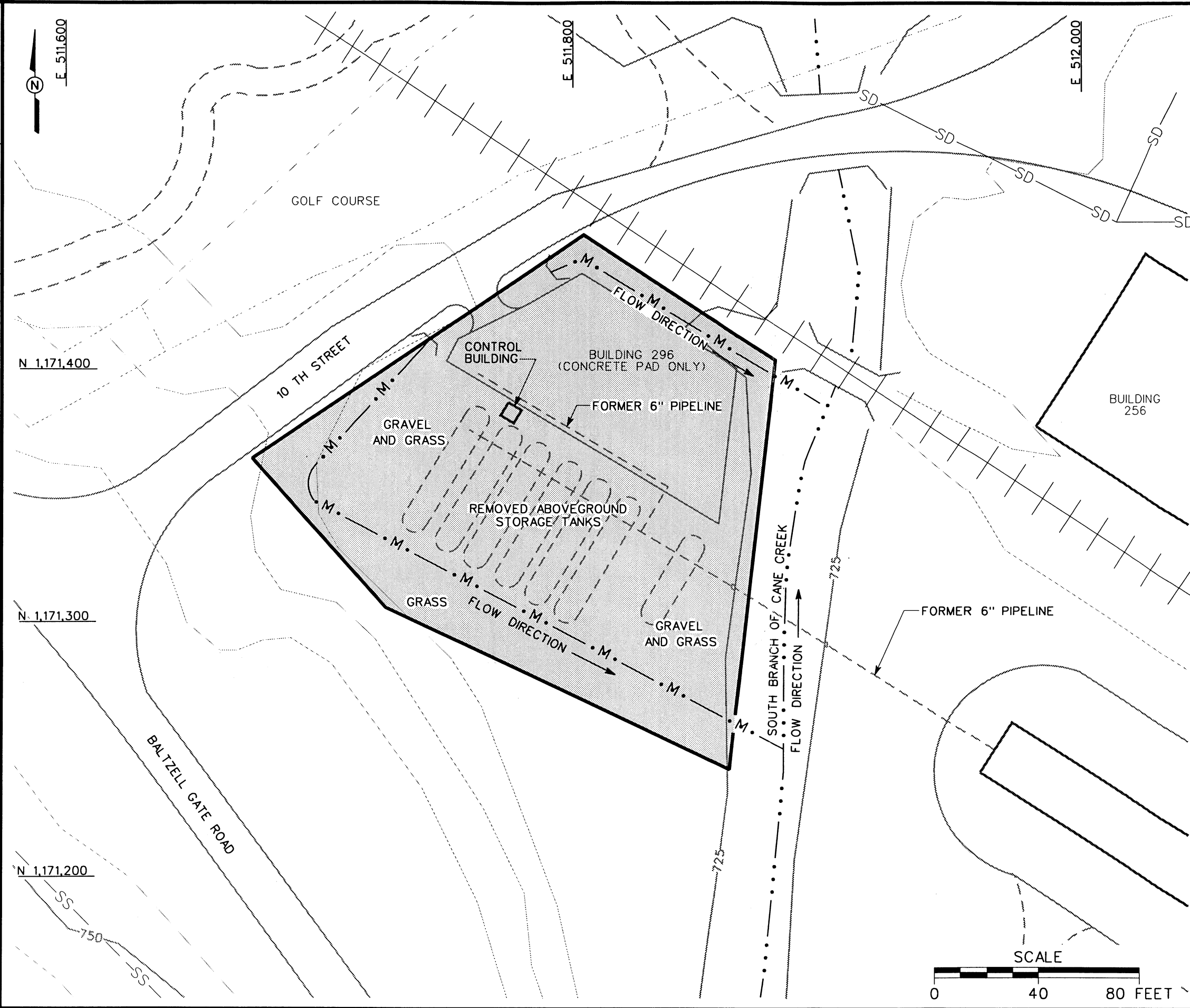
 FORT McCLELLAN BOUNDARY

SCALE  
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**FIGURE 1-1**  
**SITE LOCATION MAP**  
**BULK STORAGE AREA BUILDING 296**  
**PARCEL 60(6)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

 INTERNATIONAL  
TECHNOLOGY  
CORPORATION



- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - PAVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS
  - PARCEL BOUNDARY
  - BRIDGE
  - CULVERT WITH HEADWALL
  - SURFACE DRAINAGE / CREEK
  - MANMADE SURFACE DRAINAGE FEATURE
  - RAILROAD
  - SANITARY SEWER LINE
  - STORM DRAINAGE LINE

**FIGURE 1-2**  
**SITE MAP**  
**BULK STORAGE AREA, BUILDING 296**  
**PARCEL 60(6)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

**IT** INTERNATIONAL  
TECHNOLOGY  
CORPORATION

The parent material washed mainly from sandstone and shale, but some of it originated from limestone. Philo soils occur on first bottoms along most streams in the northern part of Calhoun County. The surface soil is very dark grayish-brown to dark-brown fine sandy loam, and the subsoil is dark-brown, slightly mottled fine sandy loam.

The Stendal series consists of strongly acid, somewhat poorly drained soils that are developing in general alluvium that washed chiefly from sandstone and shale. Some of the material originated from limestone. These soils occur on first bottoms along most streams in the northern part of Calhoun County. The surface soil is a dark grayish-brown fine sandy loam and the subsurface soil is a dark-brown, mottled fine sandy loam.

This mapping unit consists of Philo and Stendal fine sandy loams, 0 to 2 percent slopes (PhA) which is prevalent along Cane Creek and South Branch of Cane Creek throughout FTMC. This unit of the soil types (Philo and Stendal series) is developing in general alluvium on nearly level bottoms that are subject to flooding. The surface soil ranges from dark grayish brown a grayish brown to dark brown. The subsoil ranges from dark brown to yellowish brown. A few areas are weakly cemented at depths of 30 to 38 inches. Runoff is slow, and flooding commonly occurs during low or heavy rain of short duration. Infiltration is medium and permeability is moderate. The capacity for moisture is high. Depth to the water table may be as shallow as 1 to 2 feet especially close to South Branch.

### ***1.3 Scope of Work***

The scope of work for activities associated with the SI at this site, specified by the statement of work (USACE, 1998), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Collect two direct-push subsurface soil samples, five direct-push groundwater samples, one surface water sample, one sediment sample, and three depositional soil samples to determine if potential site-specific chemicals (PSSC) are present at the Bulk Storage Area, Building 296, Parcel 60(6) site and to provide data to determine any future planned corrective measures and closure activities.

At completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to evaluate the absence or presence of PSSC at this site, and to recommend further actions, if appropriate.

## ***2.0 Summary of Existing Environmental Studies***

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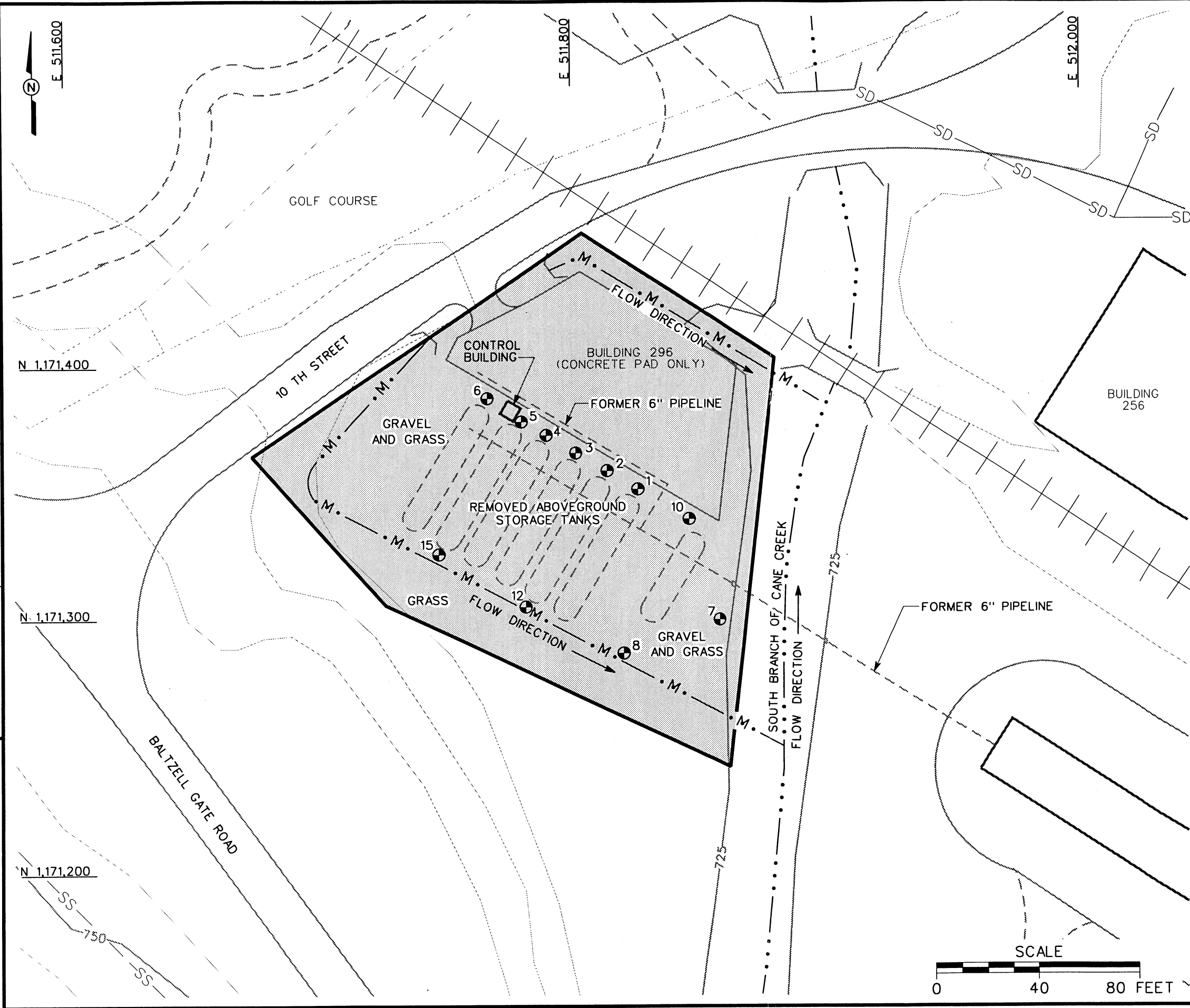
ESE conducted an environmental baseline survey (EBS) to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, Alabama Department of Environmental Management (ADEM), U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

In preparation for the decommissioning and removal of the ASTs at FTMC, Alabama, soil samples were collected at selected locations underneath and surrounding the seven ASTs. The soil samples were analyzed for polynuclear aromatic hydrocarbon (PAH) compounds that would be suspected diesel range fuel constituents. The purpose of the sampling effort was to determine

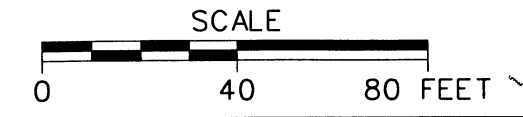
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 ENGR. CHK. BY: J. YACOB  
 INITIATOR: J. RAGSDALE  
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- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - PAVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS
  - PARCEL BOUNDARY
  - BRIDGE
  - CULVERT WITH HEADWALL
  - SURFACE DRAINAGE / CREEK
  - MANMADE SURFACE DRAINAGE FEATURE
  - RAILROAD
  - SANITARY SEWER LINE
  - STORM DRAINAGE LINE
  - USACE SOIL BORING LOCATION

**FIGURE 2-1**  
 USACE SOIL SAMPLE LOCATIONS  
 BULK STORAGE AREA, BUILDING 296  
 PARCEL 60(6)

U. S. ARMY CORPS OF ENGINEERS  
 MOBILE DISTRICT  
 FORT MCLELLAN  
 CALHOUN COUNTY, ALABAMA  
 Contract No. DACA21-96-D-0018



whether significant petroleum contamination existed at the Bulk Storage Area site prior to the removal of the ASTs (Woodall, 1996).

On January 25, 1996, Mobile District Corps of Engineers personnel began collecting soil samples at the Bulk Storage Area site (Woodall, 1996). Sample locations were selected based on the highest likelihood of encountering petroleum contamination. Samples were collected directly underneath the drain valves for each of the seven tanks. Samples were also collected near the containment area drain valve, near the fuel pump shed and at the opposite end from the drain valves near three tanks selected at random. The soil sample locations are shown on Figure 2-1.

Samples were collected using a hand auger. The intent was to collect samples at depths of 1 foot and 3 feet below ground surface (bgs) at each sample location. However, the crushed stone and gravel imbedded in the clay layer at several sampling locations made this difficult with a hand auger. Petroleum odors were not observed at any location during sampling. There were not any visual signs of petroleum contamination such as stressed vegetation observed at the site during the sampling effort (Woodall, 1996).

The soil samples were analyzed for diesel range fuel constituents using Method 8100 for PAH compounds. Analytical results determined that PAHs were not present above the detected limit in all samples. The sample locations, depths, and analytical results are presented in Table 2-1. The list of Method 8100 PAH compounds is presented in Table 2-2.

The Bulk Storage Area, Building 296 site was identified in the EBS as a Category 6 CERFA site (ESE, 1998). This CERFA site is a parcel where PSSCs were stored, and possibly released onto the site or to the environment, and/or were disposed of on site property. Limited sampling and analyses of soil has not verified whether or not there has been a potential release or disposal of PSSCs on site. The Bulk Storage Area, Building 296 site lacks adequate documentation and, therefore, requires additional evaluation to determine the environmental condition of the parcel.



**Table 2-1**

**USACE Soil Sample Results<sup>a</sup>  
Bulk Storage Area, Building 296, Parcel 60(6)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample I.D.	Sample Depth (ft)	Analytical Results	Detection Limit (µg/kg)
0	FMTK-0000-0001	0.5	Undetected	382
1	FMTK-0001-0001	1.0	Undetected	390
2	FMTK-0002-0001	2.0	Undetected	378
2	FMTK-0002-0002	3.0	Undetected	390
3	FMTK-0003-0001	1.0	Undetected	393
3	FMTK-0003-0002	2.5	Undetected	378
4	FMTK-0004-0001	1.0	Undetected	1930
5	FMTK-0005-0001	1.5	Undetected	392
5	FMTK-0005-0002	2.5	Undetected	421
6	FMTK-0006-0001	1.5	Undetected	392
6	FMTK-0006-0002	3.0	Undetected	412
7	FMTK-0007-0001	1.0	Undetected	389
8	FMTK-0008-0001	1.0	Undetected	399
9	FMTK-0009-0001	1.0	Undetected	389
12	FMTK-0012-0001	1.0	Undetected	403
15	FMTK-0015-0001	0.5	Undetected	378

<sup>a</sup>Woodall, W. L., 1996, *Soil Sampling Report for POL Storage Tank Area, Fort McClellan, Alabama*, August.

µg/kg - Micrograms per kilogram.

ft - Feet.

I.D. - Identification

**Table 2-2**

**Method 8100 Polynuclear Aromatic Hydrocarbon Compounds  
Bulk Storage Area, Building 296, Parcel 60(6)  
Fort McClellan, Calhoun County, Alabama**

Analyte
Napthalene
Acenaphthene
Anthracene
Fluoranthene
Fluorene
Pyrene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Acenaphthylene
Benzo(g,h,i)perylene
Phenanthrene
1-Methylnapthalene
2-Methylnapthalene

## **3.0 Site-Specific Data Quality Objectives**

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### **3.1 Overview**

The data quality objectives (DQO) process is followed to establish data requirements and to support the decision-making process associated with the action selection for Bulk Storage Area, Building 296, Parcel 60(6) site. This section incorporates the components of the DQO process described in the EPA publication EPA 540-R-93-071, *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to Bulk Storage Area, Building 296, Parcel 60(6) site is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and to establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

### **3.2 Data Users and Available Data**

The intended data users and available data related to the SI at the Bulk Storage Area, Building 296 site, presented in Table 3-1, have been used to formulate a conceptual site exposure model (CSEM) presented in Section 3.3. This CSEM was developed to support the preparation of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual PSSC in the site media.

### **3.3 Conceptual Site Exposure Model - Human Health Evaluation**

The CSEM provides the basis for identifying and evaluating the potential risks to human health to support the risk assessment. The CSEM includes plausible receptor scenarios and potential

Table 3-1

**Summary of Data Quality Objectives**  
**Site Investigation, Bulk Storage Area, Building 296, Parcel 60(6)**  
**Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other Contractors Possible future land users	None	<u>Contaminant Source</u> Bulk Storage Area (Former Heating Oil Tank Farm with ASTs)  <u>Migration Pathways</u> Infiltration and leaching to groundwater and subsurface soil. Dust emissions and volatilization to air. Runoff and erosion to surface water and sediment. Biotransfer to fish.  <u>Potential Receptors</u> Groundskeeper (future) Construction worker (future) Resident (future) Recreational site user (current and future)  <u>PSSC</u> Heating oil, other petroleum products; possibly solvents and metals	<u>Subsurface Soil</u>  <u>Groundwater</u>  <u>Surface Water</u>  <u>Sediment</u>  <u>Depositional Soil</u>	SI to confirm the presence of contaminants in the site media     Definitive quality data for future decision making	<u>Subsurface Soil</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	2 direct-push soil subsurface samples + QC
					<u>Groundwater</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	5 direct-push groundwater samples + QC
					<u>Surface Water</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	1 surface water sample + QC
					<u>Sediment</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	1 sediment sample + QC
					<u>Depositional Soil</u> TCL VOCs, TCL SVOCs, TAL Metals	Definitive data in CESAS Level B data packages	3 depositional soil samples + QC

ADEM - Alabama Department of Environmental Management.

AST - Aboveground storage tank.

CESAS - Corps of Engineers South Atlantic Savannah.

DOD - U.S. Department of Defense.

EPA - U.S. Environmental Protection Agency.

FTMC - Fort McClellan.

QC - Quality control.

PSSC - Potential site-specific chemicals.

VOC - Volatile organic compound.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

USACE - U.S. Army Corps of Engineers.

exposure pathways. The CSEM graphically presents possible pathways, by which a potential receptor may be exposed, including sources, release and transport pathways, and exposure routes. In addition, it facilitates consistent and comprehensive evaluation of human health risks, and helps ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptor scenarios
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not required to identify receptor contact scenarios with a contaminated source medium.

Previously, this area served as a heating oil storage tank farm. The tanks have been removed. Currently, the only potential human receptors are golfers who enter this site to retrieve stray golf balls from the adjacent golf course. For conceptual modeling purposes, the most likely PSSC are petroleum products. Primary contaminant release, if any, was probably to surface soil and subsurface soil. Potential contaminant transport pathways include infiltration to subsurface soil; infiltration and leaching to groundwater; erosion and runoff to surface water and sediment; dust emissions and volatilization to ambient air; and biotransfer to fish. The only currently plausible receptor scenario is the recreational site user.

Potential receptor scenarios excluded from the analysis of current site usage include:

- Construction worker: The site is not currently under construction.
- Resident: The site is not currently used nor slated for residential purposes.
- Venison consumption: The site does not support substantive hunting.

It is likely that Building 296, Parcel 60(6) will either be developed for industrial purposes, or abandoned. Residential use in conjunction with, or in lieu of commercial usage is also possible, and interaction with the use of the adjacent golf course is anticipated. Thus, plausible future receptor scenarios considered in this CSEM include the groundskeeper, the construction worker, the resident, the recreational site user, and fish consumption.

The latter scenario is due to the possibility of future fishing in Cane Creek. Summaries of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways are provided in Figure 3-1 and Table 3-1.

### ***3.4 Decision-Making Process, Data Uses, and Needs***

The decision-making process consists of a seven-step process that is presented in detail in Section 4.3 of the WP and will be followed during the SI at the Bulk Storage Area, Building 296 site. Data uses and needs are summarized in Table 3-1.

#### ***3.4.1 Risk Evaluation***

Confirmation of contamination at the Bulk Storage Area, Building 296 site will be based on comparing detected PSSC to site-specific screening levels developed in the WP. EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in the installation-wide WP.

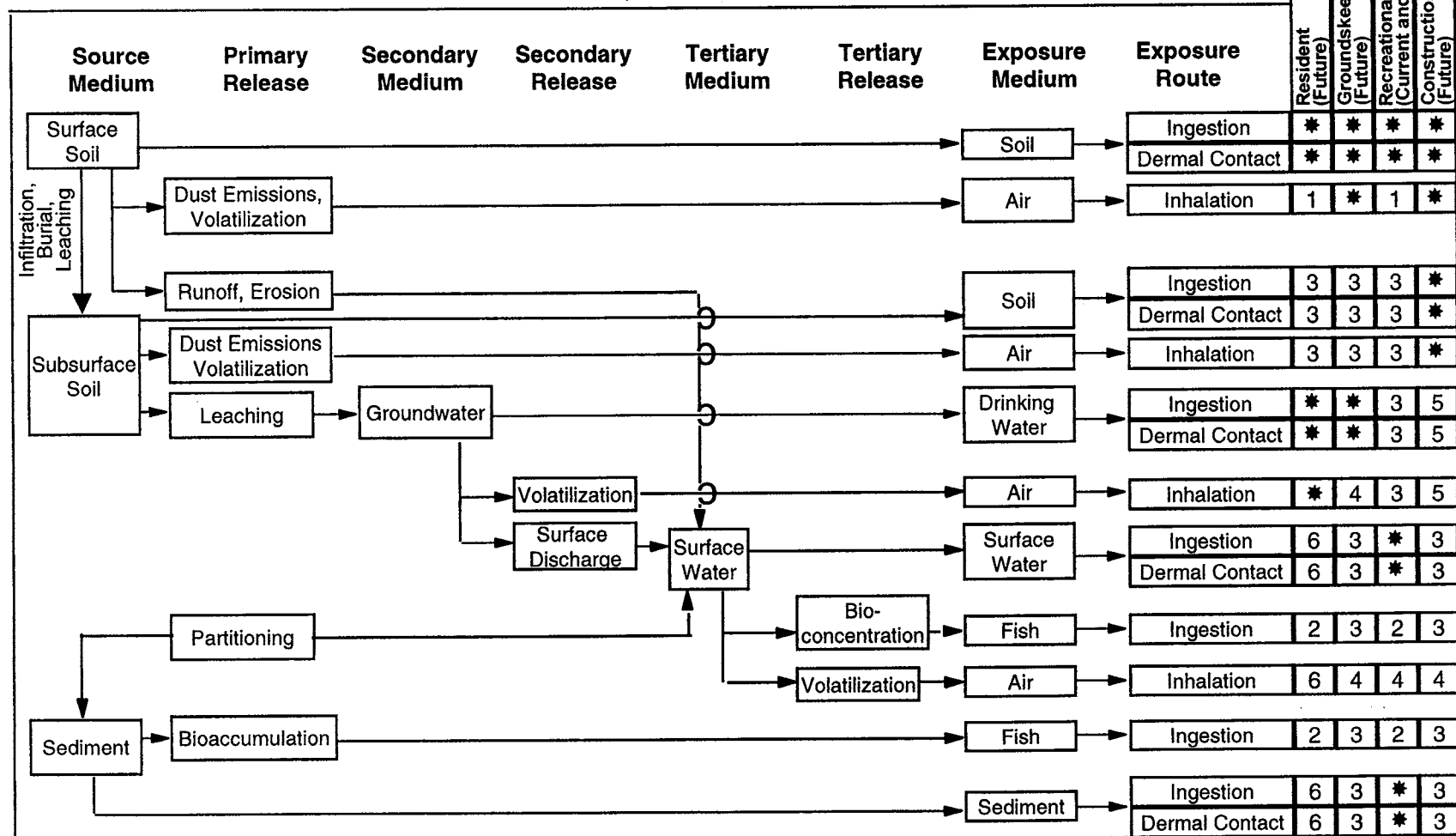
#### ***3.4.2 Data Types and Quality***

Subsurface soil, groundwater, surface water, sediment, and depositional soil will be sampled and analyzed to meet the objectives of the SI at the Bulk Storage Area, Building 296 site. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

#### ***3.4.3 Precision, Accuracy, and Completeness***

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the approved QAP.

**Human Health Conceptual Site Exposure Model for Bulk Storage Area  
Building 296, Parcel 60(6)  
Fort McClellan, Alabama**



\* = Complete exposure pathway quantified in SSSL development.

\* = Volatilization from undisturbed surface soil deemed insignificant; soil is likely to be paved or vegetated, reducing dust emissions to insignificant levels; inhalation pathway not quantified.

2 = Evaluated under venison and fish consumption scenario.

3 = Incomplete exposure pathway.

4 = Although theoretically complete, this pathway is judged to be insignificant.

5 = Although theoretically complete, these pathways are not quantified for the construction worker because SSSLs developed for the groundskeeper would be at least as restrictive.

6 = Although theoretically complete, SSSLs for these pathways are developed only for the recreational site user. SSSLs developed for the recreational site user may be used to estimate risk for this receptor.

## **4.0 Field Activities**

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### **4.1 Utility Clearances**

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil and groundwater samples will be collected, using the procedure as specified in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the FTMC personnel to clear the proposed locations for utilities, and obtain dig permits. Once locations are approved for intrusive sampling, the stakes will be labeled as cleared.

### **4.2 Environmental Sampling**

The environmental sampling program at Bulk Storage Area, Building 296, Parcel 60(6) site includes the collection of two subsurface soil samples, four direct-push groundwater samples, three depositional soil samples, one surface water sample, and one sediment sample for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site in order to determine the environmental condition of the site and any further action to be conducted at the site.

#### **4.2.1 Subsurface Soil Sampling**

The subsurface soil samples will be collected from two soil borings installed at the Bulk Storage Area, Building 296, Parcel 60(6) site.

##### **4.2.1.1 Sample Locations and Rationale**

The subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations.

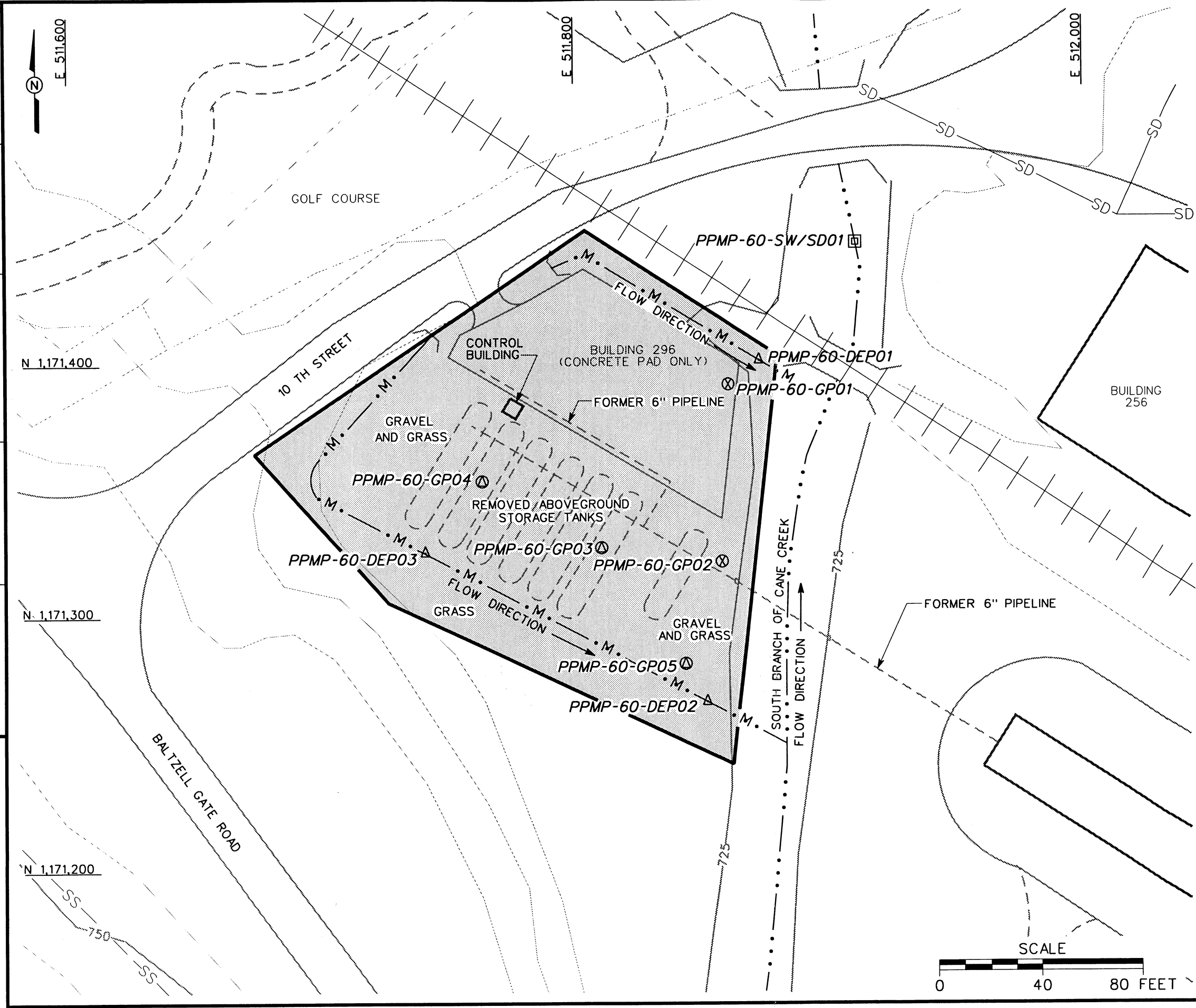
##### **4.2.1.2 Sample Collection**

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soils samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the



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DATE LAST  
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15:27:50  
INITIATOR: J. RAGSDALE  
DWG. NO.: 774645es.128  
PROJ. MGR.: J. YACOB  
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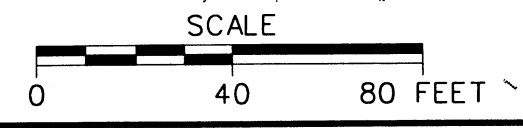


- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - PAVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS
  - PARCEL BOUNDARY
  - BRIDGE
  - CULVERT WITH HEADWALL
  - SURFACE DRAINAGE / CREEK
  - MANMADE SURFACE DRAINAGE FEATURE
  - RAILROAD
  - SANITARY SEWER LINE
  - STORM DRAINAGE LINE
  - PROPOSED SURFACE WATER/ SEDIMENT SAMPLE
  - PROPOSED GROUNDWATER SAMPLE
  - PROPOSED GROUNDWATER AND SUBSURFACE SOIL SAMPLE
  - PROPOSED DEPOSITIONAL SOIL SAMPLE

**FIGURE 4-1**  
**PROPOSED SAMPLING LOCATIONS**  
**BULK STORAGE AREA, BUILDING 296**  
**PARCEL 60(6)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

**IT** INTERNATIONAL  
TECHNOLOGY  
CORPORATION



**Table 4-1**

**Sample Locations And Rationale  
Bulk Storage Area, Building 296, Parcel 60(6)  
Fort McClellan, Calhoun County, Alabama**

<b>Sample Location</b>	<b>Sample Media</b>	<b>Sample Location Rationale</b>
PPMP-60-GP01	Subsurface soil and groundwater	Boring location is downgradient on concrete pad where spills may have occurred during product transfer. Sample data will indicate if potential site-specific chemicals (PSSC) releases have occurred and if contaminated soil or groundwater exists from historical use of the Bulk Storage Area at Building 296 as a heating oil tank farm.
PPMP-60-GP02	Subsurface soil and groundwater	Boring location is downgradient of where aboveground storage tanks (AST) and former pipeline were located. Sample data will indicate if PSSC releases have occurred and if contaminated soil or groundwater exists from historical use of the Bulk Storage Area at Building 296 as a heating oil tank farm.
PPMP-60-GP03	Groundwater	Boring location is downgradient of area where ASTs were located on site. Sample data will indicate if PSSC releases have occurred and if contaminated groundwater exists from historical use of the Bulk Storage Area at Building 296 as a heating oil tank farm.
PPMP-60-GP04	Groundwater	Boring location is in the center of area where ASTs were located on site. Sample data will indicate if PSSC releases have occurred and if contaminated groundwater exists from historical use of the Bulk Storage Area at Building 296 as a heating oil tank farm.
PPMP-60-GP05	Groundwater	Boring location is the upper end of where ASTs were on site. Sample data will indicate if PSSC releases have occurred and if contaminated soil exists from historical use of the Bulk Storage Area at Building 296 as a heating oil tank farm.
PPMP-60-SW/SD01	Surface Water and Sediment	Sample location is in South Branch of Cane Creek downgradient of the site. Evidence of PSSC mobility from within the site would likely be reflected at this location.
PPMP-60-DEP01	Depositional Soil	Samples collected from the man-made waterway. Sample location represents a low elevation area where surface water runoff could collect, and potentially percolate into the substratum or deposit suspended or dissolved materials after evaporation.
PPMP-60-DEP02	Depositional Soil	Samples collected from the man-made waterway. Sample location represents a low elevation area where surface water runoff could collect, and potentially percolate into the substratum or deposit suspended or dissolved materials after evaporation.
PPMP-60-DEP03	Depositional Soil	Samples collected from the man-made waterway. Sample location represents a low elevation area where surface water runoff could collect, and potentially percolate into the substratum or deposit suspended or dissolved materials after evaporation.

PSSC - Potential site-specific chemicals.

Table 4-2

**Subsurface Soil, Sediment and Depositional Soil Sample Designations and QA/QC Sample Quantities**  
**Bulk Storage Area, Building 296, Parcel 60(6)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
PPMP-60-GP01	PPMP-60-GP01-DS-KEE0001-REG	soil	a	PPMP-60-GP01-DS-KEE0002-FD	PPMP-60-GP01-DS-KEE0003-FS		TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-GP02	PPMP-60-GP02-DS-KEE0004-REG	soil	a				TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-SW/SD01	PPMP-60-SW/SD01-SD-KEE2001-REG	sediment	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size
PPMP-60-DEP01	PPMP-60-DEP01-DEP-KEE0006-REG	depositional soil	0-1			PPMP-60-DEP01-DEP- KEE0006-MS PPMP-60-DEP01-DEP-KEE0006-MSD	TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-DEP02	PPMP-60-DEP02-DEP-KEE0007-REG	depositional soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-DEP03	PPMP-60-DEP03-DEP-KEE0008-REG	depositional soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals

\* Actual subsurface soil sample depth selected for analysis will be at the discretion of the on-site geologist and will be based on field observations.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

N/A - Not applicable

analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

Soil samples will be collected continuously for the first 12 feet or until groundwater or refusal is reached. A detailed lithologic log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background. Typically, the sample showing the highest reading will be selected and sent to the laboratory for analysis. If none of the samples indicate the presence of contamination using the PID, then the deepest interval from the soil boring will be sampled and submitted to the laboratory for analysis. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSC at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSC and/or additional sample data would provide insight to the existence of any PSSC.

#### ***4.2.2 Direct-Push Groundwater Sampling***

Groundwater samples will be collected from five temporary wells completed in the soil borings installed at Bulk Storage Area, Building 296, Parcel 60(6) site.

##### ***4.2.2.1 Sample Locations and Rationale***

Groundwater samples will be collected from temporary wells installed at the site. Groundwater samples will be collected from the locations shown on Figure 4-1. The groundwater sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3. The exact sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

##### ***4.2.2.2 Sample Collection***

Groundwater samples will be collected in accordance with the procedures and methods specified in Section 4.7.1.1 of the SAP. Direct-push temporary wells will be advanced into the water table (to a depth where sufficient water is encountered) to collect a groundwater sample. The direct-push temporary well will be completed in the boring to collect a water sample from the water table surface.

Table 4-3

**Groundwater and Surface Water Sample Designations and QA/QC Sample Quantities**  
**Bulk Storage Area, Building 296, Parcel 60(6)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
PPMP-60-GP01	PPMP-60-GP01-GW-KEE3001-REG	groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals,
PPMP-60-GP02	PPMP-60-GP02-GW-KEE3002-REG	groundwater	a	PPMP-60-GP02-GW-KEE3003-FD	PPMP-60-GP02-GW-KEE3004-FS		TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-GP03	PPMP-60-GP03-GW-KEE3005-REG	groundwater	a			PPMP-60-GP03-GW-KEE3005-MS PPMP-60-GP03-GW-KEE3005-MSD	TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-GP04	PPMP-60-GP04-GW-KEE3006-REG	groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-GP05	PPMP-60-GP05-GW-KEE3007-REG	groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals
PPMP-60-SW/SD01	PPMP-60-SW/SD01-SW-KEE2001-REG	surface water	N/A				TCL VOCs, TCL SVOCs, TAL Metals

\* Sample depth will depend on where sufficient first water is encountered to collect a water sample.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

N/A - Not applicable

At direct-push temporary well locations, where either refusal is reached before encountering water or direct-push temporary wells do not yield sufficient groundwater for laboratory analysis, conventional drilling methods will be utilized to install temporary monitoring wells. Temporary monitoring wells will be completed as specified in the addendum to Appendix C of the SAP, Section C.5.7 (IT, 1998c).

Sample documentation and COC will be recorded as specified in Section 4.11 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### ***4.2.3 Surface Water Sampling***

One surface water sample will be collected from the South Branch of Cane Creek that flows north on the east side of the site.

##### ***4.2.3.1 Sample Locations and Rationale***

The surface water sampling rationale is listed in Table 4-1. The surface water sample will be collected from the location proposed on Figure 4-1. The surface water sample designation and required QA/QC sample requirements are listed in Table 4-3. The exact sampling location will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

##### ***4.2.3.2 Sample Collection***

The surface water sample will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The sample will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### ***4.2.4 Sediment Sampling***

One sediment sample will be collected from the South Branch of Cane Creek that flows north on the east side of the site. The sediment sample will be collected at the same location as the surface water sample described in Section 4.2.3.

#### **4.2.4.1 Sample Locations and Rationale**

The proposed location for the sediment sample is shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. The sediment sample designation and required QA/QC sample requirements are listed in Table 4-2. The actual sediment sample point will be at the discretion of the ecological sampler based on the drainage pathways and actual field observations.

#### **4.2.4.2 Sample Collection**

Sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The sediment sample will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.5 Depositional Soil Sampling**

Three depositional soil samples will be collected at the Bulk Storage Area site.

##### **4.2.5.1 Sample Locations and Rationale**

The depositional soil samples will be collected in the surface drainage features that surround the site. The sampling rationale is listed in Table 4-1 and the proposed sampling locations are shown on Figure 4-1. The depositional soil sample designations, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample points will be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

##### **4.2.5.2 Sample Collection**

Depositional soil sample collection will be conducted in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The sample will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.3 Decontamination Requirements**

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be

performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP. Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

#### **4.4 Surveying of Sample Locations**

Sampling locations will be marked with pin flags, stakes, and/or flagging, and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use temporary wells to determine water levels, a higher level of accuracy is required. Temporary wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

#### **4.5 Analytical Program**

Samples collected at locations specified in Chapter 4.0 of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as the EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from Bulk Storage Area, Building 296 site consist of the following list of analytical suites:

- Target compound list (TCL) volatile organic compounds - Method 5035/8260B
- TCL semivolatile organic compounds - Method 8270C
- Target analyte list metals - Method 6010B/7000.

The sediment sample will be analyzed for the following list of parameters:

- Total organic carbon - Method 9060
- Grain size - ASTM D-421/D-422.



The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

#### ***4.6 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP. Completed analysis request/COC records will be secured and included with each shipment of coolers to the subcontract laboratory below:

Sample Receiving  
Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Telephone: (423) 588-6401.

Split samples collected for the USACE laboratory will be shipped to the following address:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060  
Telephone: (770) 919-5270.

#### ***4.7 Investigation-Derived Waste Management***

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at the Bulk Storage Area, Building 296, Parcel 60(6) site will include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

#### ***4.8 Site-Specific Safety and Health***

Safety and health requirements for this SI are provided in the SSHP attachment for the Bulk Storage Area, Building 296, Parcel 60(6). The SSHP attachment will be used in conjunction with the SHP.

Table 4-4

**Analytical Samples**  
**Bulk Storage Area, Building 296, Parcel 60(6)**  
**Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples <sup>a</sup>					Quanterra	QA Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/. QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
Bulk Storage Area, Building 296, Parcel 60(6): 6 water matrix samples (5 groundwater samples and 1 surface water sample); 6 soil matrix samples (2 subsurface soil samples, 1 sediment sample, and 3 depositional soil samples)													
TCL VOCs	8260B	water	normal	6	1	6	1	1	1	1	1	11	1
TCL SVOCs	8270C	water	normal	6	1	6	1	1	1	1	1	10	1
Total TAL Metals	6010B/7000	water	normal	6	1	6	1	1	1	1	1	10	1
TCL VOCs	8260B	soil	normal	6	1	6	1	1	1	1	1	10	1
TCL SVOCs	8270C	soil	normal	6	1	6	1	1	1	1	1	10	1
TAL Metals	6010B/7000	soil	normal	6	1	6	1	1	1	1	1	10	1
Bulk Storage Area, Building 296, Parcel 60(6) Subtotal:						36	6	6	6	1	6	61	6

<sup>a</sup>Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number. Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed 4 field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to: Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Attn: John Reynolds  
Tel: 423-588-6401 Fax: 423-584-4315

USACE Laboratory split samples  
are shipped to:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060-3112  
Tel: 770-919-5270

MS/MSD - Matrix spike/matrix spike duplicate.  
QA/QC - Quality assurance/quality control.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.  
TCL - Target compound list.  
TOC - Total organic carbon.  
VOC - Volatile organic compound.

## ***5.0 Project Schedule***

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The project schedule for the SI activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team on a monthly basis.

## 6.0 References

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Environmental Science and Engineering Inc. (ESE), 1998, ***Final Environmental Baseline Survey, Fort McClellan, Alabama***, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 1998a, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama***, August.

IT Corporation (IT), 1998b, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama***, August.

IT Corporation (IT), 1998c, Letter to Ellis Pope from Jeanne Yacoub, "Procedures for Temporary Residuum Monitoring Well Installation, Conversion, and Abandonment," November, 1998.

Jaye, Lee, Environmental Engineer, Bregman & Company, 1998, Telephone Communication with John Ragsdale, IT Corporation, June 30.

U.S. Army Corps of Engineers (USACE), 1998, ***Statement of Work for Task Order CK005, Modification No. 1, Site Investigations at Fort McClellan, Alabama, Including Ecological Screening Sites (Creeks and Tribes), and Removal of Indoor Firing Ranges***, May.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plans***, Engineer Manual EM 200-1-3, September 1.

U.S. Environmental Protection Agency (EPA), 1993, ***Data Quality Objectives Process for Superfund, Interim Final Guidance***, EPA 540-R-93-071, September.

Woodall, W. L., 1996, ***Soil Sampling Report for POL Storage Tank Area, Fort McClellan, Alabama***, August.